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• PRAIRIE FARM REHABILITATION BRANCH • REGINA •

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1958-59



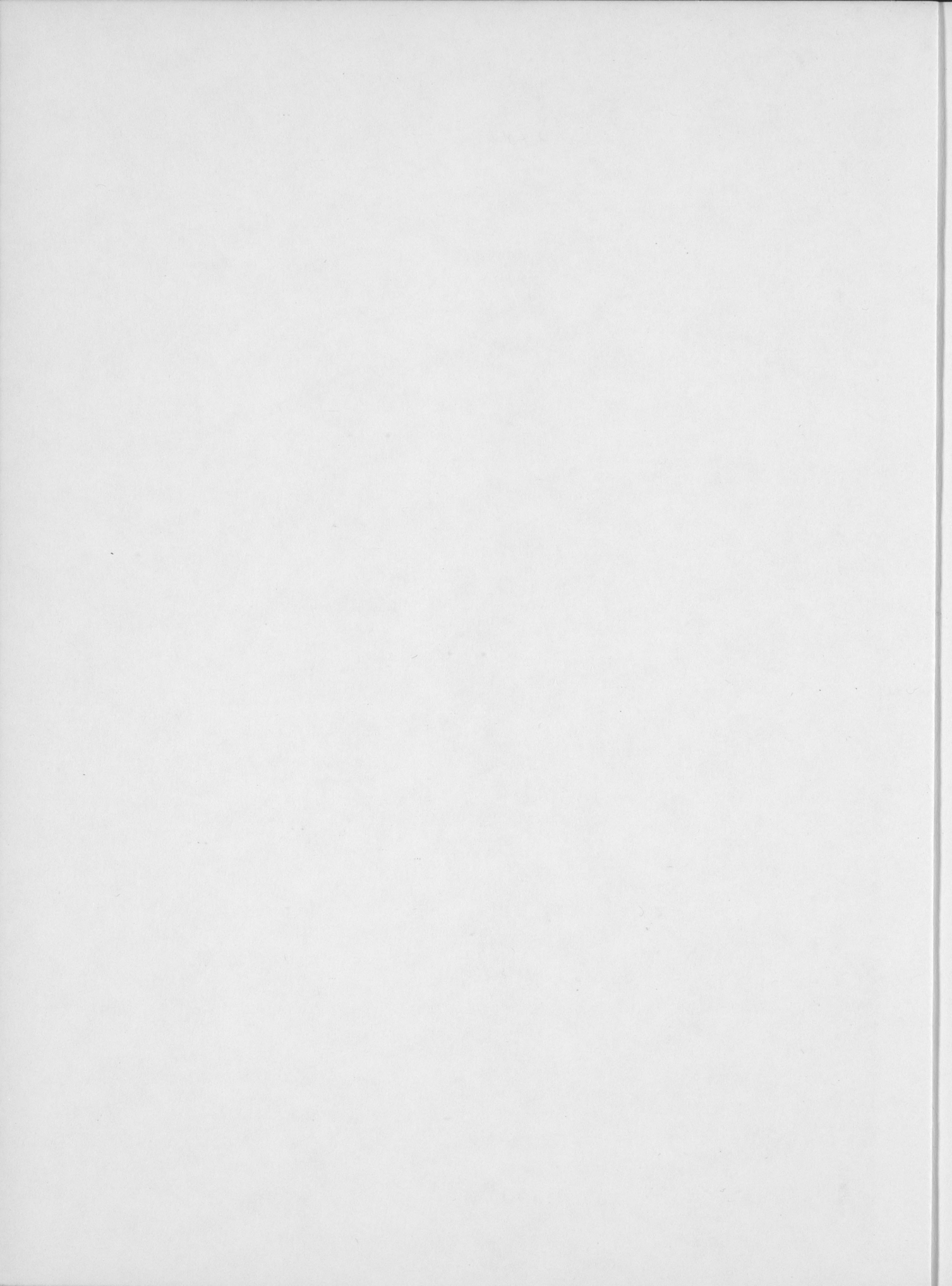
P.F.R.A. BOUNDARY

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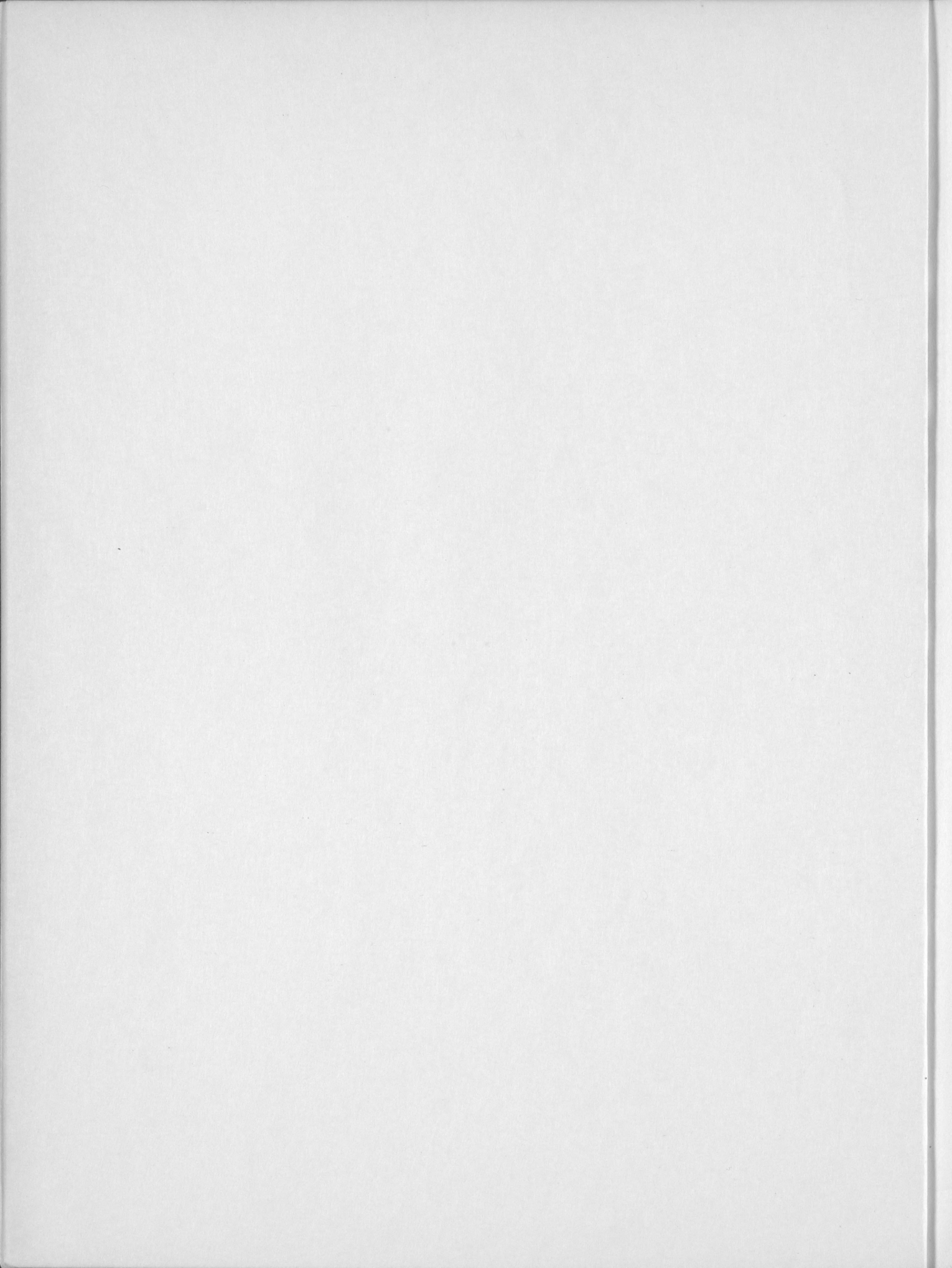
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AND RELATED ACTIVITIES

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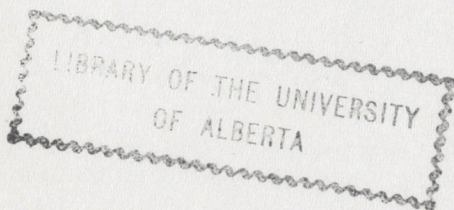


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INTRODUCTION

The Prairie Farm Rehabilitation Act was passed by the Parliament of Canada in April 1935 to provide for "the rehabilitation of the drouth and soil drifting areas in the Provinces of Manitoba, Saskatchewan and Alberta". The Act provided for the spending of one million dollars a year over a period of four and three quarter years, to alleviate the immediate problems created by the prolonged drouth being experienced in Western Canada. Provision was made by the Act for the promotion of new and improved cultural practices to control soil drifting and for the conservation of surface water resources for agricultural purposes. To cope with further problems affecting agriculture at that time, the Prairie Farm Rehabilitation Act was amended in 1937 to make provision for the establishing of a land utilization and resettlement program. By further amendment in 1939, this Act was to remain in force indefinitely. With these amendments and additional financial allocations, a long-term water conservation and land utilization program has been developed under the terms of the Prairie Farm Rehabilitation Act.

The area within the boundaries established by the P.F.R.A., contains approximately 110 million acres of land. Some 50 million acres of improved farm land, which is more than half the total improved agricultural acreage in Canada, lies within this area. In addition to supervising water conservation and land utilization programs throughout the P.F.R.A. area, the organization which has developed to administer the Prairie Farm Rehabilitation Act, has in recent years been made responsible for major irrigation and reclamation projects in Western Canada. These are projects which because of their size or location, are not included in the regular P.F.R.A. appropriation but are provided for by special votes of Parliament.

The P.F.R.A. program is designed to bring about desirable adjustments in agricultural practices which will assist in establishing a sound and progressive agricultural economy in Western Canada. By encouraging diversification of agricultural production, this program has already been effective in developing increased stability and security of farm income. The conservation of water on farms and in rural communities, and better land utilization, help to counteract the problems created by drouth.

Although this report will deal principally with the work done by P.F.R.A. in 1958, it will also review in a general way, the progress of the various programs and projects developed under the supervision of P.F.R.A. since its inception in 1935.

INTRODUCTION

Number 1019

The Prairie Farm Rehabilitation Act was passed by the Parliament of Canada in April 1935 to provide for "the rehabilitation of the drought and soil-ditching areas in the provinces of Saskatchewan and Alberta". The Act provided for the spending of one million dollars a year over a period of four and three-quarter years, to alleviate the immediate problems created by the prolonged drought being experienced in Western Canada. Provision was made by the Act for the promotion of new and improved cultural practices to combat soil-ditching and for the conservation of surface water resources for agricultural purposes. To cope with further problems affecting agriculture at that time, the Prairie Farm Rehabilitation Act was amended in 1937 to make provision for the establishing of a land utilization and resettlement program. By further amendment in 1939, this Act was to remain in force indefinitely. With these amendments and other national financial allocations, a long-term water conservation and land utilization program has been developed under the terms of the Prairie Farm Rehabilitation Act.

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WATER DEVELOPMENT PROGRAM ADMINISTRATION and ORGANIZATION

The Prairie Farm Rehabilitation Act is administered by a Director who is responsible to the Deputy Minister of Agriculture in Ottawa. The Director's office is located at Regina, Saskatchewan, where headquarters for the administration has been established. In addition to the Director's Office the organization at Regina consists of the Water Development Branch, the Community Pasture Branch, and the Engineering Services Branch.

The Director's Office co-ordinates the activities of the different Branches and administers the Resettlement and Rehabilitation program. The Construction, Equipment and Supply Division; Land Division; Planning and Information Division; and Administration Division are directly responsible to the Director.

The Water Development Branch supervises the development of an extensive program of farm and community water storage projects, and numerous small scale irrigation schemes.

The Community Pasture Branch undertakes the construction of new pastures and supervises the operation and maintenance of the existing Community Pastures throughout Saskatchewan and Manitoba.

The Engineering Services Branch, composed of the following Divisions – Hydrology, Soil Mechanics, Design, Air Photo Analysis and Engineering Geology, Surveys and Drainage – performs all engineering services for the investigation, design, and construction of all projects under P.F.R.A. administration.

In addition to the Head Office in Regina, there are District, Regional, and Project Offices situated throughout the Western Provinces. From the Project Offices there is usually a further breakdown to Field Offices, the number depending upon the size and type of the project being administered by the Project Office.

Since P.F.R.A. activities are closely allied to those of certain Provincial Departments, every endeavour is made to co-operate with these agencies. Similarly the P.F.R.A. maintains a close liaison with other branches and departments of the Government of Canada, such as the Experimental Farms Service, Science Service, Economics Division and the Water Resources Branch of the Department of Northern Affairs and National Resources.

WATER DEVELOPMENT PROGRAM

As a result of prolonged drouth conditions in the early 1930s, farm water supplies had become critical on many farms throughout the drought area of the Prairie Provinces. To improve farm water supplies one of the first programs established under the Prairie Farm Rehabilitation Act was to provide financial and engineering assistance in the development of surface water resources for domestic use, stockwatering and small scale irrigation. This assistance in the establishing of reliable water supplies for farm use made it possible for many farmers to rehabilitate themselves without having to move to a new location. In recent years the assistance given by P.F.R.A. in the development of water storage on farms and in rural communities is proving to be a valuable incentive in the conservation of surface water resources. Since 1935, over 60,000 water conservation projects varying in size from individual farm dugouts to community dams, have been constructed under the P.F.R.A. water development program.



Sprinkler irrigating a farm garden with water from a dugout.

Ref. No. 1267

Projects which involve the construction of a small dam or dugout to serve either an individual farmer or neighboring farmers, are known generally as "farm projects". When a larger number of farmers or a rural community benefits by the development of a water conservation project, it is then

classified as a "community project". The construction of both "farm projects" and "community projects" is under the supervision of the Water Development Branch of the Prairie Farm Rehabilitation Administration. In addition to the water conservation projects supervised by the Water Development Branch, the Federal Government through P.F.R.A., undertakes the construction of large water conservation projects in communities where there is a special need. These are known as "large water development projects" and are constructed only where the Government of Canada believes them to be in the best interest of Canada as a whole.

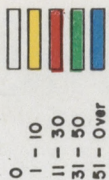
In 1958 there was a very limited runoff in many of the watersheds in the P.F.R.A. area. The drouth, which commenced in 1957 in many districts, continued in 1958 with only very light and irregular precipitation in most areas. In August there were many dry farm dugouts and dams in south-eastern Saskatchewan. The drouth conditions and the availability of construction equipment resulted in a very large number of farm reservoirs being constructed during the 1958 season.

Farm Projects

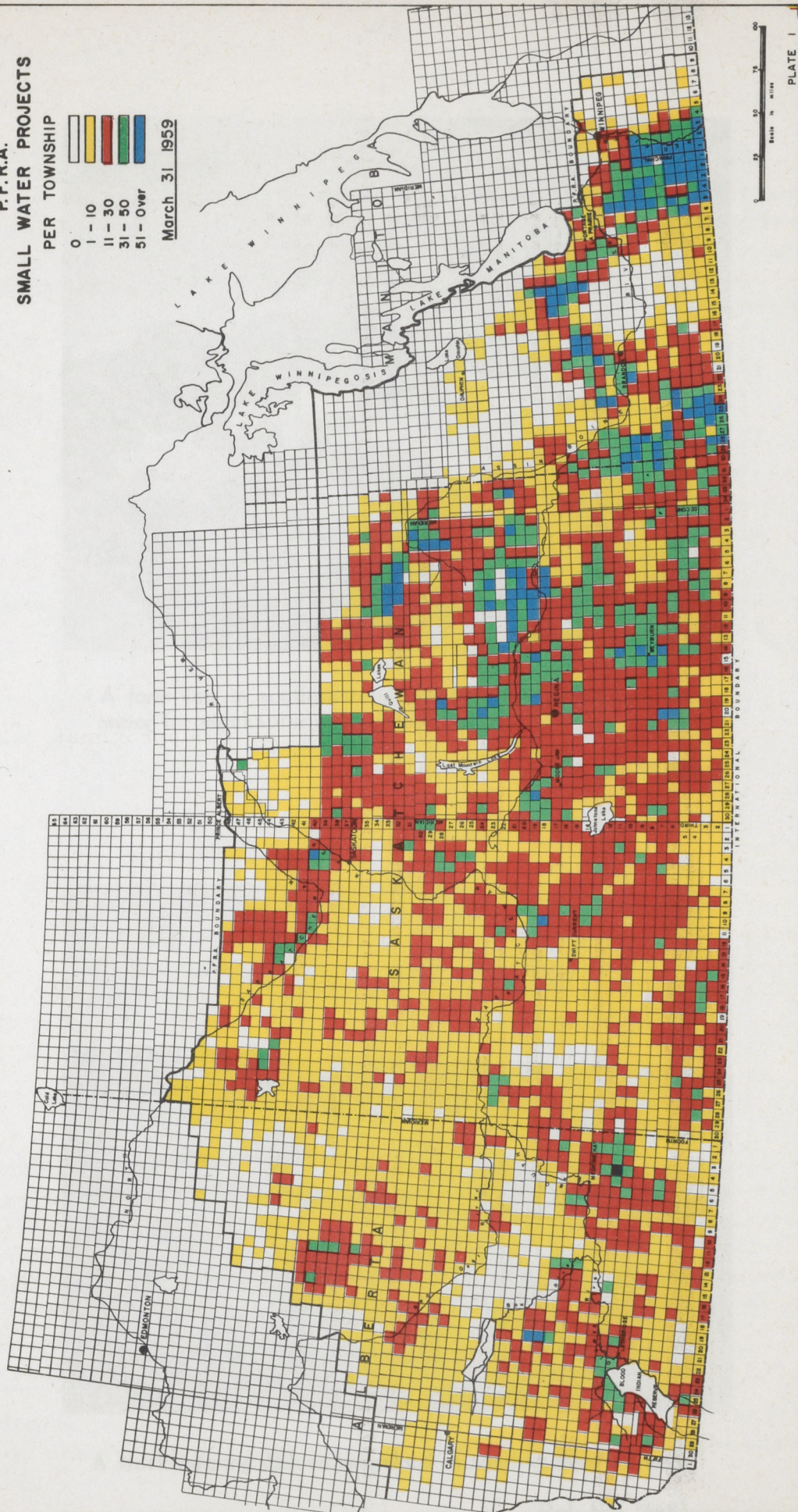
Individual or neighboring farmers are granted direct financial assistance in the construction of dugouts, dams or dykes for water conservation on their farms. The amount of financial assistance is based on the type and size of project and during 1958-59 amounted to approximately 30% of the total cost of farm projects. During the latter part of the year authorization was given to a change of rates of financial assistance given for the construction of "farm projects". The rate for earth work was increased from 4 1/2¢ to 7¢ per cubic yard; the maximum grant for a dugout was increased from \$125.00 to \$250.00; the maximum grant for a stockwatering dam was increased from \$150.00 to \$300.00; the maximum grant for an irrigation project was increased from \$350.00 to \$600.00, and the maximum grant for neighbor projects was increased from \$500.00 to \$1000.00. This will increase the percentage of the total cost paid by the Federal Government to possibly 60%. In addition to financial assistance received, all engineering services are provided free of charge. The responsibility for actual construction, however, remains with the individual or neighboring farmers who make application for assistance with the project.

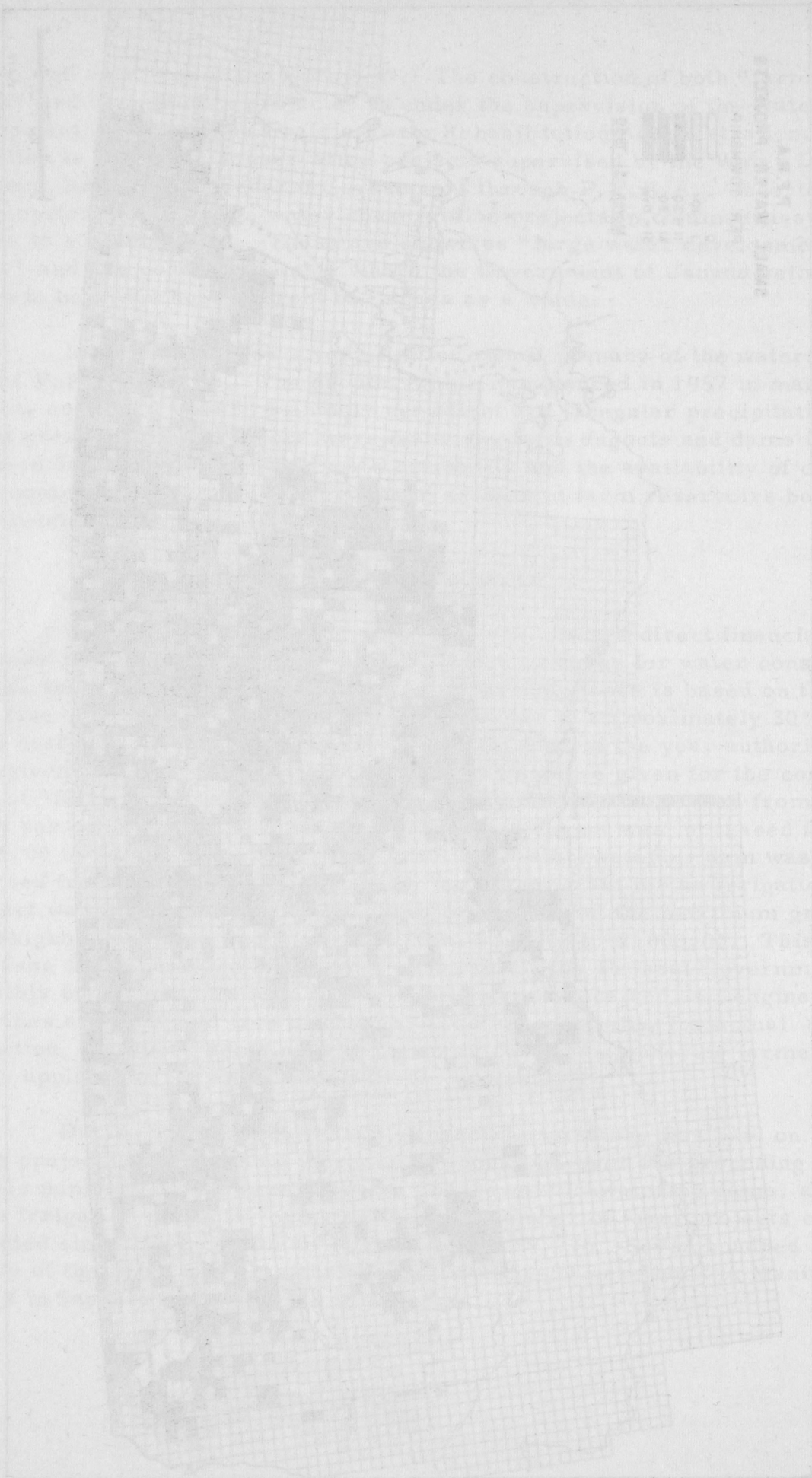
During the 1958-59 season, financial assistance was paid on 3,682 farm projects which was an increase of about 44% over the preceding year. Of this number, 3,257 were dugouts, 264 were stockwatering dams, and 161 were irrigation projects, bringing the total number of farm projects constructed since the inception of P.F.R.A., to 59,776. Seven hundred and ninety of the 3,682 projects constructed in 1958-59 were built in Manitoba, 2,114 in Saskatchewan and 778 in Alberta.

P.F.R.A.
SMALL WATER PROJECTS
PER TOWNSHIP



March 31 1959







A farm dam in southwestern Saskatchewan which provides water for stockwatering and domestic use.

Ref. No. 11732

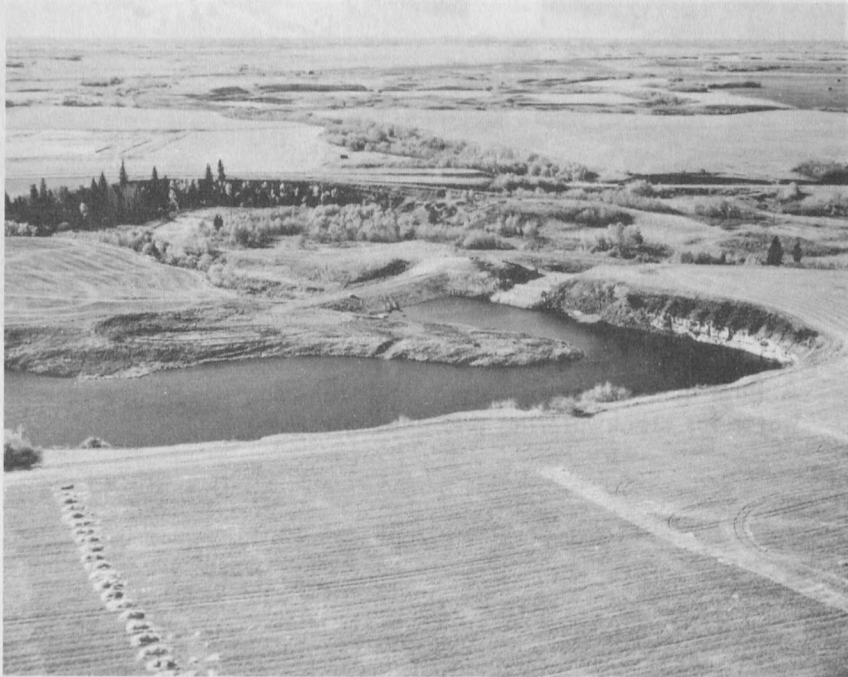


A stockwatering dam on rangeland in southwestern Alberta.

Ref. No. 16681

Community Projects

When water conservation projects large enough to serve a number of farmers or a rural community are built, P.F.R.A. supplies all engineering services and contributes a greater proportion to the cost of construction. These projects are usually located on the more well defined watersheds and provide a means of storing larger quantities of water for use throughout the area, particularly during dry periods.



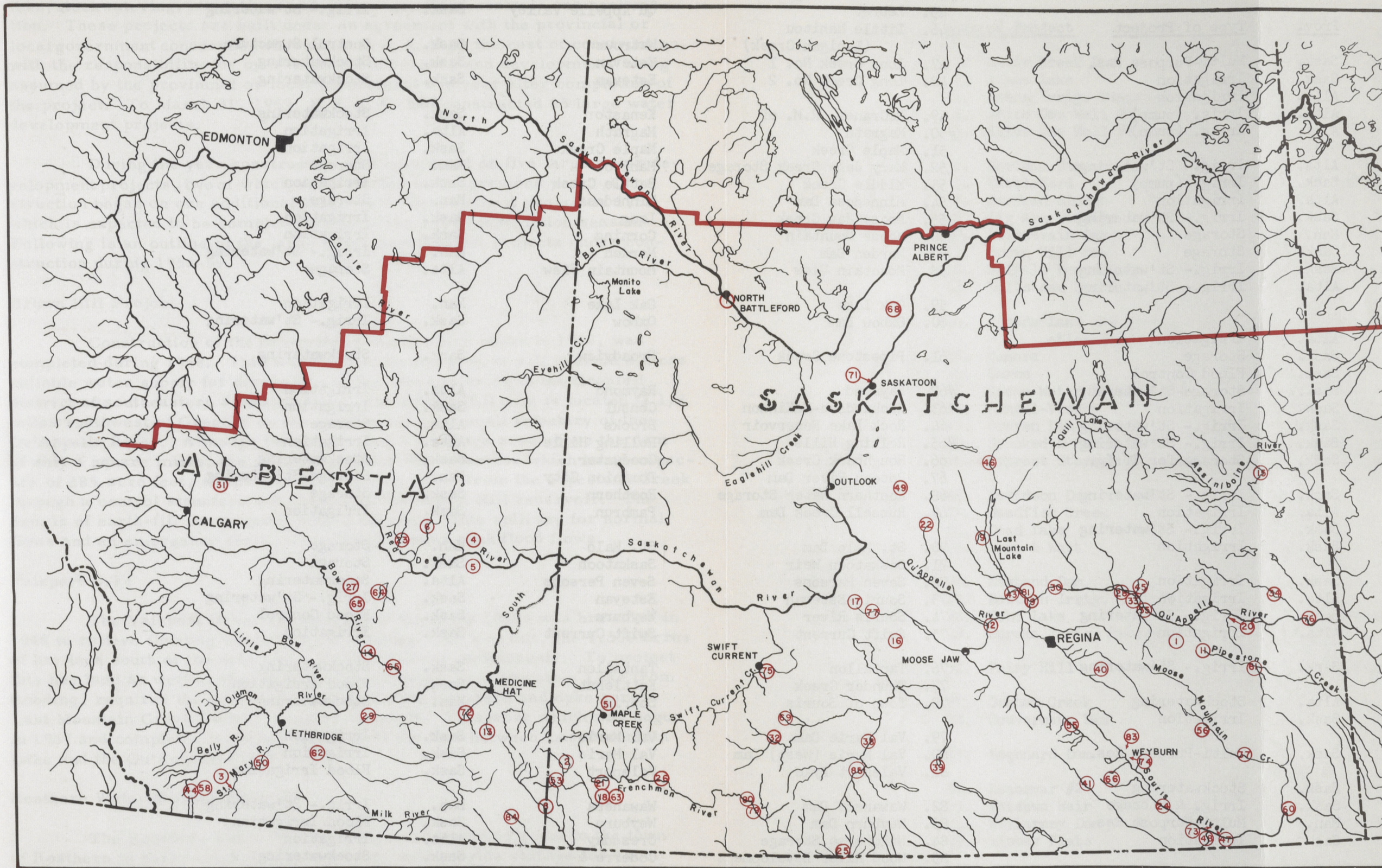
A community dam and reservoir at Castor in central Alberta, used for stockwatering and also as a domestic water supply for the community.

Ref. No. 5797

Construction was authorized on 54 new community projects during 1958-59, with construction being advanced or improvements being carried out on 12 community projects authorized in previous years. To the end of March 1959, over 400 "community projects" had been constructed under P.F.R.A. supervision. A complete list of the "community projects" under construction in 1958 may be found in Appendix III showing the type, location, size and cost.

Large Water Development Projects

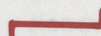

The construction of large water conservation projects, usually located on the main watersheds in the P.F.R.A. area, is undertaken by the



LARGE WATER DEVELOPMENT PROJECTS

25 0 25 50
SCALE IN MILES

LEGEND

-  P.F.R.A. Boundary
-  Project Location Number

MARCH 31, 1959.

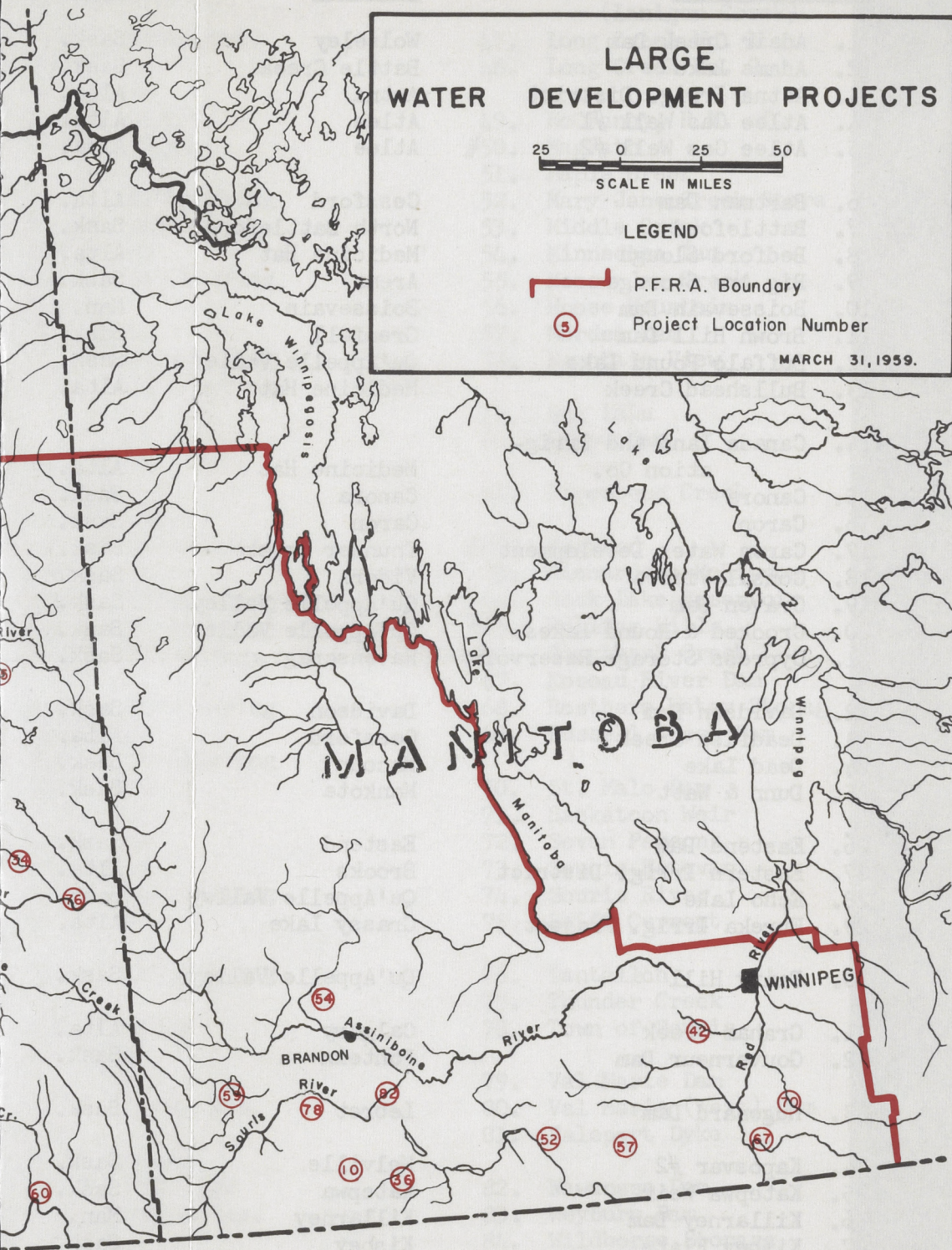


PLATE II

LARGE WATER DEVELOPMENT PROJECTS1935 - March 31, 1959

<u>Name of Project</u>	<u>Location</u>	<u>Prov.</u>
1. Adair Creek Dam	Wolseley	Sask.
2. Adams Lake	Battle Creek	Sask.
3. Aetna Irrig. District	Aetna	Alta.
4. Atlee Gas Well #1	Atlee	Alta.
5. Atlee Gas Well #2	Atlee	Alta.
6. Bartman Dam	Cessford	Alta.
7. Battleford	North Battleford	Sask.
8. Bedford Slough	Medicine Hat	Alta.
9. Big Arm Storage	Arena	Sask.
10. Boissevain Dam	Boissevain	Man.
11. Brown Hill Dam	Grenfell	Sask.
12. Buffalo Pound Lake	Qu'Appelle Valley	Sask.
13. Bullshead Creek	Medicine Hat	Alta.
#14. Canada Land and Irrig- ation Co.	Medicine Hat	Alta.
15. Canora	Canora	Sask.
16. Caron	Caron	Sask.
17. Caron Water Development	Thunder Creek	Sask.
18. Consul-Vidora	Vidora	Sask.
19. Craven Dam	Qu'Appelle Valley	Sask.
20. Crooked & Round Lakes	Qu'Appelle Valley	Sask.
21. Cypress Storage Reservoir	Ravenscrag	Sask.
22. Davidson Dam	Davidson	Sask.
23. Deadfish Creek	Cessford	Alta.
24. Dead Lake	Macoun	Sask.
25. Dunn & Watt	Mankota	Sask.
26. Eastend Dam	Eastend	Sask.
27. Eastern Irrig. District	Brooks	Alta.
28. Echo Lake	Qu'Appelle Valley	Sask.
29. Eureka Irrig. Project	Grassy Lake	Alta.
30. Fairy Hill	Qu'Appelle Valley	Sask.
31. Graham Creek	Calgary	Alta.
32. Gouverneur Dam	Ponteix	Sask.
33. Hugonard Dam	Lebret	Sask.
34. Kaposvar #2	Melville	Sask.
35. Katepwa Weir	Katepwa	Sask.
36. Killarney Dam	Killarney	Man.
37. Kisbey Flats	Kisbey	Sask.
38. Lafleche Dam	Lafleche	Sask.
39. Lake of the Rivers	Assiniboia	Sask.
40. Lajord	Lajord	Sask.
41. Larson Dam	Radville	Sask.
42. LaSalle River Dams (2)	LaSalle	Man.

PROJECTS

1959

		Name of Project	Location	Prov.	Type of Project
		43. Last Mountain Lake	Qu'Appelle Valley	Sask.	Irrig.- St'watering
		#44. Leavitt Irrigation	Mountain View	Alta.	Irrigation
		45. Lebret	Qu'Appelle Valley	Sask.	Irrig.- St'watering
Prov.	Type of Project	46. Little Manitou (Ianigan Creek)	Watrous	Sask.	Control Structure
Sask.	Multi-Purpose Res.	47. Long Creek No. 1	Estevan	Sask.	Stockwatering
Sask.	Irrigation	48. Long Creek No. 2	Estevan	Sask.	Stockwatering
Alta.	Irrigation				
Alta.	Irrig. (pump)	49. McCraney, R.M. of	Kenaston	Sask.	Stockwatering
Alta.	Irrig. (pump)	#50. Magrath	Magrath	Alta.	Irrigation
		51. Maple Creek	Maple Creek	Sask.	Irrigation
Alta.	Irrig.- St'watering	52. Mary Jane Creek Storage	Manitou	Man.	Storage
Sask.	Irrig. (pump)	53. Middle Creek	Battle Creek	Sask.	Irrigation
Alta.	Irrigation	54. Minnedosa Dam	Minnedosa	Man.	Storage
Sask.	Irrig.- St'watering	55. Moose Jaw Creek	Lang	Sask.	Irrigation
Man.	Storage	56. Moose Mountain	Corning	Sask.	Irrigation
Sask.	Storage	57. Morden Dam	Morden	Man.	Irrig.- St'watering
Sask.	Irrig.- St'watering	58. Mountain View	Mountain View	Alta.	Storage
Alta.	Irrig.- St'watering				
		59. Oak Lake	Oak Lake	Man.	Irrigation
		60. Oxbow Dam	Oxbow	Sask.	Irrig.- St'watering
Alta.	Irrigation				
Sask.	Storage	61. Pipestone Creek	Broadview	Sask.	Stockwatering
Sask.	Flood Control				
Sask.	Storage-St'watering	#62. Raymond	Raymond	Alta.	Irrigation
Sask.	Irrigation	63. Richardson-McKinnon	Consul	Sask.	Irrigation
Sask.	Irrig.- St'watering	64. Rock Lake Reservoir	Brooks	Alta.	Storage
Sask.	Irrig.- St'watering	#65. Rolling Hills	Rolling Hills	Alta.	Irrigation
Sask.	Storage for Irrig.	66. Roughbark Creek	Goodwater	Sask.	Stockwatering
		67. Roseau River Dam	Dominion City	Man.	Storage-St'watering
Sask.	Irrig.- St'watering	68. Rosthern Water Storage	Rosthern	Sask.	Storage
Alta.	Irrigation	69. Russell Creek Dam	Pambrun	Sask.	Irrigation
Sask.	Irrig.- St'watering				
Sask.	Irrigation	70. St. Malo Dam	St. Malo	Man.	Storage
		71. Saskatoon Weir	Saskatoon	Sask.	Storage
Sask.	Irrigation	72. Seven Persons	Seven Persons	Alta.	Stockwatering
Alta.	Irrigation	73. Souris-Estevan	Estevan	Sask.	Irrig.- St'watering
Sask.	Irrig.- St'watering	74. Souris River	Weyburn	Sask.	Flood Control
Alta.	Irrigation	75. Swift Current	Swift Current	Sask.	Irrigation
Sask.	Irrig.- St'watering	76. Tantallon	Tantallon	Sask.	Stockwatering
		77. Thunder Creek	Kettlehut	Sask.	Flood Irrigation
Alta.	Stockwatering	78. Town of Souris	Souris	Man.	Stockwatering
Sask.	Irrigation				
		79. Val Marie Dam	Val Marie	Sask.	Irrigation
Sask.	Multi-Purpose Res.	80. Val Marie (West) Dam	Val Marie	Sask.	Irrigation
		81. Valeport Dyke	Valeport	Sask.	Flood Irrigation
Sask.	Stockwatering				
Sask.	Irrig. & Storage	82. Wawanesa Dam	Wawanesa	Man.	Irrig.- St'watering
Man.	Multi-Purpose Res.	83. Weyburn Dam	Weyburn	Sask.	Flood Irrigation
Sask.	Irrigation	84. Wildhorse Storage	Cressday	Alta.	Irrigation
		85. Wood River Development	Coderre & Gravelbourg	Sask.	Stockwatering

- P.F.R.A. gave assistance to a project already in existence to improve storage capacities, canals and distribution systems.

Federal Government to provide one or a combination of the following services; stockwatering, irrigation, water storage, flood control, and reclamation. These projects are built under an agreement with the provincial or local government concerned, whereby P. F. R. A. pays the cost of construction, with the responsibility for operation, maintenance, and development, being assumed by the provincial or local government one year after completion of the project. To March 31, 1959, P. F. R. A. had constructed 85 large water development projects.

During the year construction was completed on five large water development projects, two of which were started in the previous year. Construction began on one additional large water development project in 1958 which is expected to be completed early in the 1959 construction season. Following is an outline of the large water development projects under construction during 1958-59.

Brown Hill Project

Construction of the Brown Hill project which began in 1957, was completed during 1958. This water conservation project will provide a more reliable water supply for domestic use and stockwatering in the Grenfell district of southeastern Saskatchewan. The Brown Hill dam is located 1 1/2 miles southwest of Grenfell on the headwaters of a small tributary of the Qu'Appelle River. Although this coulee has a drainage area above the dam of only 4 square miles, the water supply for the reservoir which has a capacity of 285 acre feet, is assured by diverting water from the Pipestone Creek through a control structure and canal into the Brown Hill reservoir. The dam is of earth-fill construction with a concrete chute spillway for normal flows and an emergency earth cut spillway to pass peak flood flows.

Valeport Dyke

The Valeport Dyke, constructed in the early 1940s was breached in 1948 to relieve flooding conditions at Lumsden. As a result, the 1,500 acres of hay land south of the dyke were flooded almost continuously. To protect this hay land as well as the market gardens below Last Mountain Lake from flooding, required the construction of a control structure and dyke across Last Mountain Creek Valley, south of Valeport. This work which was begun in 1957 and completed in 1958, will control the flow between Last Mountain Lake and the Qu'Appelle River.

Rosthern Water Storage Project

The Rosthern Water Storage Project, located adjacent to the town of Rosthern in north-central Saskatchewan, will provide storage for about 140 acre feet of water. Because of the flat terrain in the surrounding areas, it was necessary to construct a combination dugout and dam in order to ob-



Downstream slope of Brownhill Dam south of the town of Grenfell in southeastern Saskatchewan, showing concrete chute spillway in the upper left-hand corner.

Ref. No. 16859



Valeport dyke from east bank with main control structure under construction at the bend in the dyke.

Ref. No. 15482

tain sufficient storage capacity. An earth overflow section is incorporated in the dam to take care of surplus flows. The slopes of the overflow section are to be seeded to grass in 1959. In an area where there is no other satisfactory water supply, it is estimated that some 1,300 people will benefit directly by this project as it will provide water for domestic use in the community of Rosthern and for farm use in the surrounding district.

St. Malo Storage Project

The St. Malo Project is located on the Rat River in southern Manitoba one mile from the village of St. Malo and some 35 miles south of Winnipeg. The dam will help regulate the flow of the Rat River and provide a water supply for domestic, municipal, and stockwatering purposes. The project, which has a storage capacity of 1,770 acre feet of water, involved the construction of an earth fill dam 620 feet long and 40 feet high with a concrete chute spillway capable of passing 6,000 c.f.s. At full supply level the St. Malo reservoir will be about 1 1/2 miles long and 1/4 mile in width.

Sunbeam Creek Project

A reservoir located on Sunbeam Creek within the Forest Nursery Station south of Indian Head, Saskatchewan, supplies water for irrigation required on the Station. The spillway associated with the reservoir was in a deteriorated condition and needed to be replaced in order to assure an adequate water supply. A new concrete drop inlet spillway with a 66" corrugated culvert was installed during the latter part of 1958. To further improve this project, the upstream slope of the dam was faced with gravel and rock rip-rap. This project was constructed under P.F.R.A. supervision for the Indian Head Forest Nursery Station.

Mary Jane Creek Storage Project

Construction of a water storage project on Mary Jane Creek, a tributary of the Pembina River, began in the fall of 1958. Located six miles northwest of the Town of Manitou in southern Manitoba, the Mary Jane Project will store 1,150 acre feet of water and provide an assured water supply of 275 acre feet for agricultural and municipal purposes. In an area where a reliable source of water has always been a problem, as most of the stream courses dry up during the summer and groundwater supplies are difficult to obtain, this project, which will provide water to maintain the downstream flow, will also provide a reliable supply of water for domestic use in the surrounding rural communities.

The dam will be of earth-fill, 520 feet long and 45 feet in height. A natural spillway operating in conjunction with a concrete drop inlet structure will provide the necessary controls to pass flood flows and fill riparian requirements. It is expected the project will be completed early in the 1959 construction season.



Drop inlet spillway under construction on the Sunbeam Creek Project at the Forest Nursery Station near Indian Head, Saskatchewan.

Ref. No. 16586



Completed drop inlet spillway with timber trash rack at the Forest Nursery Station near Indian Head in southeastern Saskatchewan.

Ref. No. 17276

Technical Assistance

In addition to financial assistance referred to in the previous sections the following free field services were provided by the Water Development Branch in 1958-59:-

Agricultural Services Engineering Services

Dugouts

Preliminary calls	1,768
Final inspections	3,330
Miscellaneous inspections	537

Stockwatering Dams

Preliminary calls	321	
Final Inspections	102	268
Miscellaneous inspections	218	881
Surveys completed		591
Plans prepared		427

Irrigation

Preliminary calls	293	
Final inspections	53	125
Miscellaneous inspections	283	941
Surveys completed		282
Plans prepared		187

Community Projects

Preliminary calls	209	
Final inspections	76	
Miscellaneous inspections	309	
Projects investigated		216
Projects built		46
Surveys and plans prepared		74
Maintenance		77

Sub Totals	7,499	4,115
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TOTAL		<u>11,614</u>
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The investigation of Evaporation Control on farm ponds in southern Alberta was continued in co-operation with the Experimental Farm Service. Continued contact and liaison was maintained with Ionics Incorporated Ltd., of U.S.A., manufacturers of electric membrane demineralizers. Work is being continued by this company on a demineralizer unit to serve individual or small community requirements.

COMMUNITY PASTURE PROGRAM

The Community Pasture Branch was set up following an amendment to the Prairie Farm Rehabilitation Act in 1937 which made provision for a land utilization and resettlement program. The establishing of community pastures in Manitoba and Saskatchewan has had a far reaching effect on agricultural production in Western Canada.

Large acreages of submarginal land proven unsuitable for cereal crop production are leased to the Federal Government to be developed into pasture areas. Families located within the proposed pastures are given assistance to move to better land within the same or a neighboring municipality where they are in a position to take advantage of the pasture facilities. If land is not available in these areas, farm families are assisted in moving to irrigation projects built by P.F.R.A. for resettlement purposes.

Since the inception of the Community Pasture program in 1937, a total of 1,815,265 acres of land has been developed for pasture use. This acreage includes the Mount Hope-Prairie Rose pasture north of Semans in central Saskatchewan, which was put into operation in 1958, and the Cote-San Clara pasture on the Manitoba-Saskatchewan border north of Togo, which was established in 1958 and will be put into operation in 1959. A total of 62 pasture projects were in operation in 1958. These pastures handled the equivalent of 117,032 head of cattle, a decrease from the previous year of 2,366 head. This small decrease is attributed to the prevailing pasture conditions in some areas following two comparatively dry years. The stock handled during 1958 was owned by 5,835 patrons as compared to 5,763 in 1957. Detailed statistics of the community pasture program from 1937 to 1958 will be found in Appendices V and VI of this report.

Pasture Operations

As a result of two consecutive dry years, all pastures in Saskatchewan except the Royal and Beaver Hills Pastures were stocked to capacity. A number of farmers from outside the Royal and Beaver Hills Municipalities who were in need of pasturage took advantage of this available grazing by trucking their cattle to these pastures.

The grazing season in community pastures extended from the last week in April to the end of October. In the Val Marie and Bitter Lake pastures special arrangements have been made to winter graze a limited number of cattle at regular grazing fee rates. Despite experiencing the

Special Services



Coalfield's Community Pasture headquarters located in southeastern Saskatchewan.

Ref. No. 17933

driest season for several years, the stock, in most cases when taken from the pastures, were in exceptionally good condition. The pastures as a whole held up remarkably well under the very adverse conditions. The grass carry-over in some of the pastures was below normal and a good many dams and dugouts were practically dry by fall. Additional water storage facilities were installed during the year to take full advantage of spring runoff. As a result of the attractive prices, and the fact that harvest operations were completed earlier than usual, making stubble fields available for fall grazing, large numbers of cattle were taken out of Community Pastures in September.

PRAIRIE FARM REHABILITATION ACT
MARCH 31 - 1959

AREA ENCLOSED IN 62 PASTURE UNITS

SASKATCHEWAN 1,647,685 ACRES

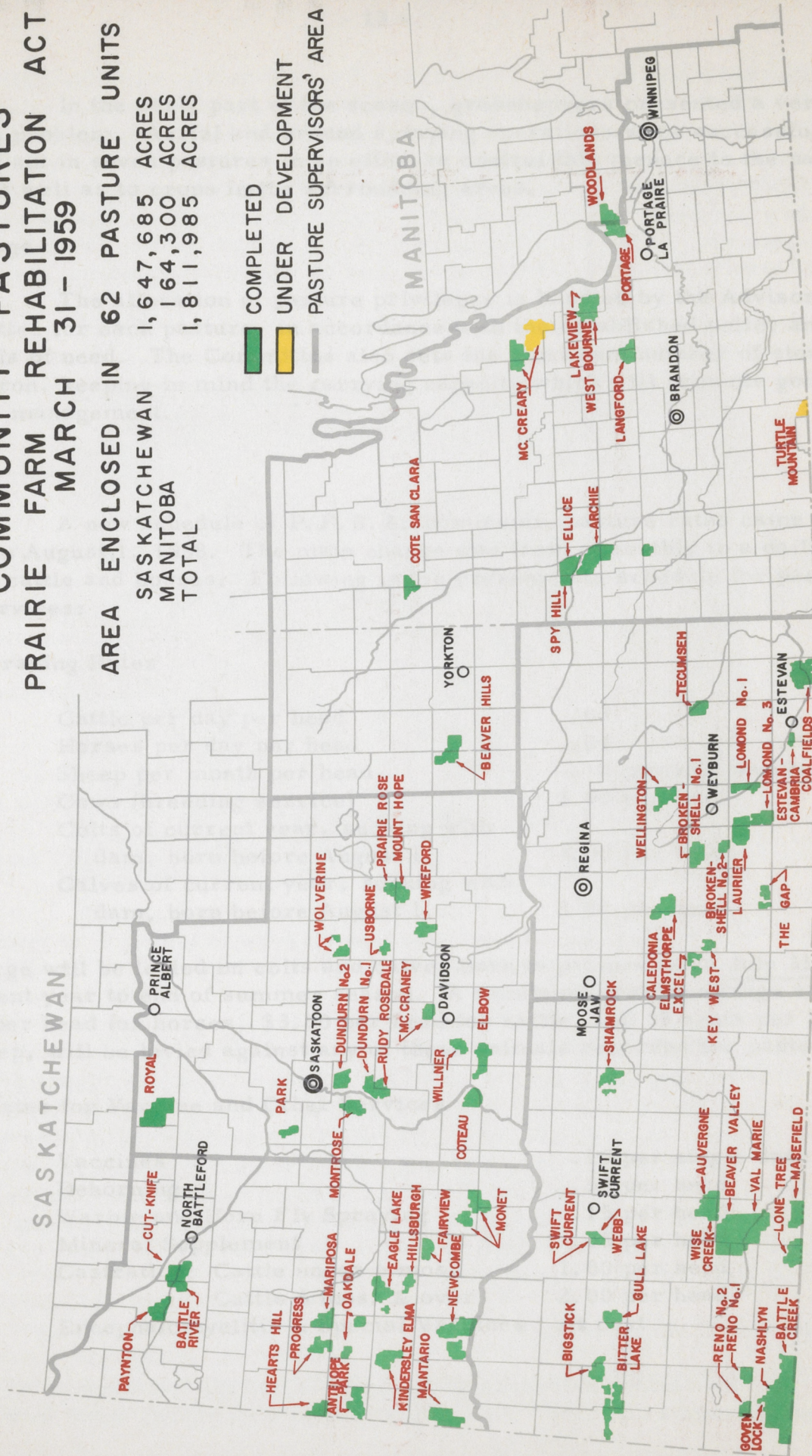
MANITOBA 164,300 ACRES

TOTAL 1,811,985 ACRES

 COMPLETED

UNDER DEVELOPMENT

PASTURE SUPERVISORS' AREA



In the early part of the season, grasshoppers presented a very serious problem. Aerial and ground spraying operations were successfully carried out in seven pastures in an effort to control this menace to the pastures as well as to crops in the surrounding areas.

Pasturage

The allocation of pasture privileges is handled by the Advisory Committee for each pasture, in accordance with the established policy and on the basis of need. The Committee also sets the maximum number of stock per patron, keeping in mind the carrying capacity which will promote good pasture management.

Fees

A new schedule of P.F.R.A. community pasture rates came into effect on August 1, 1958. The main change was from a monthly to a daily rate on cattle and horses. Following is the present rate schedule for pasture services:

Grazing Rates

Cattle per day per head	.03
Horses per day per head	.04
Sheep per month per head	.10 (provide own herder)
Cows (breeding service)	3.00 per head
Colts of current year, sucking with dam, born before August 1.	4.00 per head
Calves of current year, sucking with dam, born before August 1.	3.00 per head

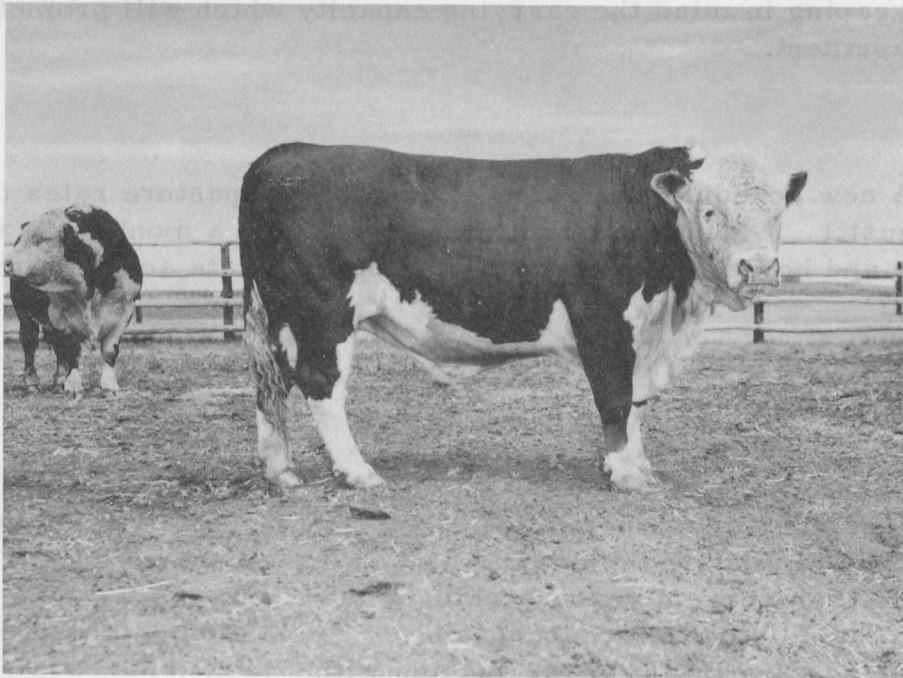
No charge will be levied on colts and calves born in pasture after July 31 of current year to end of summer season. A minimum grazing charge of \$4.00 per head for horses, \$3.00 per head for cattle, and 30 cents per head for sheep, will be levied against any of these animals recorded for pasturage.

Rates for Vaccine and Other Services

Vaccines	.15 per single dose
Dehorning	.50 per head
Warble and Horn Fly Spraying	.15 per head
Mineral Supplement	.35 per head
Castration: Cattle under 6 mos.	1.00 per head
Cattle 6 mos. & over	2.00 per head
Encephalomyelitis & Special Vaccines	At cost

Breeding Service

A sufficient number of pure bred bulls to provide adequate breeding services in community pastures are supplied by P.F.R.A. as requested by pasture patrons. An annual rental of \$40.00 is charged for each bull supplied to a pasture. The breed of bulls used is determined by a majority vote of the patrons. At the end of January 1959, P.F.R.A. had 811 bulls, of which 730 were Hereford, 68 Shorthorn, and 13 Aberdeen Angus.



Hereford bulls of the type made available for use in Community Pastures under the P.F.R.A. breeding service program.

Ref. No. 15782

In 1958 there were 1,025 bulls used in the breeding service, 802 of these bulls having been supplied by P.F.R.A. and 223 were rented from pasture patrons. An estimate 90% calf crop resulted from the 31,977 cows serviced. P.F.R.A. purchased 21 mature and 90 yearling bulls in 1958. The yearling bulls are being developed at the Archie and Bitter Lake Pastures along with the bull calves purchased in 1957. One hundred and seventy-nine bulls unfit for further breeding service were sold for slaughter and 27 bulls died from various causes during the year.

Diseases and Special Services

No serious outbreaks of disease affected the livestock in P.F.R.A. community pastures in 1958. As compared to former years, there was

very little pink eye or foot rot. All cattle affected by warbles were treated upon entering the pastures. An effective program for the control of external parasites such as horn flies, mosquitoes, lice and ticks was carried on by spraying and the use of treated back scratchers. Other services required in good livestock management are provided by the pasture management when they are required.

Livestock Insurance

To offset losses by death, which are inevitable in livestock production, livestock insurance is carried in most community pastures. The total livestock losses from all causes in 1958-59 were 554 cattle and 6 horses which amounts to less than 1/2 of 1 % of the livestock handled.

Hay and Grass Seed

A total of 4,683 tons of hay and green feed to be used for feeding the pasture bulls and headquarters stock was harvested on P.F.R.A. community pastures by pasture managers during the year. A small percentage of this hay was put up by neighboring farmers on a share basis. Owing to the dry season no grass seed was harvested in 1958.

Regrassing

During the 1958 season, 1,870 acres were seeded to grass in 9 of the community pastures. This included 460 acres of crested wheat grass, 1,015 acres of brome grass, and 395 acres of mixed grasses.

Fire and Fire Protection

No buildings were destroyed by fire during the year 1958-59. Approved type fire extinguishers are maintained in all buildings for immediate use.

Several small grass fires, usually caused by lightning, occurred in the pastures. Fireguards are maintained in prairie pastures by two motorized graders. In 1958, the graders maintained 722 miles of established fireguard. In addition, several miles were maintained by contract and by pasture managers using pasture equipment.

Pasture Construction

To maintain and extend pasture facilities, eight construction crews were employed by P.F.R.A. in 1958-59. Besides the work in the operating pastures, construction on the 18,240 acre Cote-San Clara Pasture was completed and construction was advanced on the 72,320 acre McCreary Pasture in Manitoba. In addition, two water development crews carried out an extensive maintenance program on domestic and stockwatering facilities located in the various P.F.R.A. community pastures.



Pasture gate construction on the Val Marie Community
Pasture in southwestern Saskatchewan.

Ref. No. 10825

Following is a summary of the Pasture Construction Activities
for the 1958-59 season:

Particulars	Projects Completed in 1958	Repair Work Completed in 1958	Total to March 31, 1959
Fencing	99 1/4	162	4,331
Corrals	1	7	161
Pasture Managers' Dwellings	4		56
Riders' Cabins	3		36
Barns	1		57
Garages	2		57
Bull Sheds	4	1	49
Others (Granaries, Oil Sheds, Chicken House, Pump Houses)	6		164

Water Development	Projects Completed in 1958	Repair Work Completed in 1958	Total to March 31, 1959
Windmills	26	8	371
Wells	23		312
Springs	7		167
Dams	17		250
Dugouts	25	18	606

Total number of acres enclosed as at March 31, 1958 - 1,792,995 (X)

Total number of acres enclosed 1958 construction season - 18,990

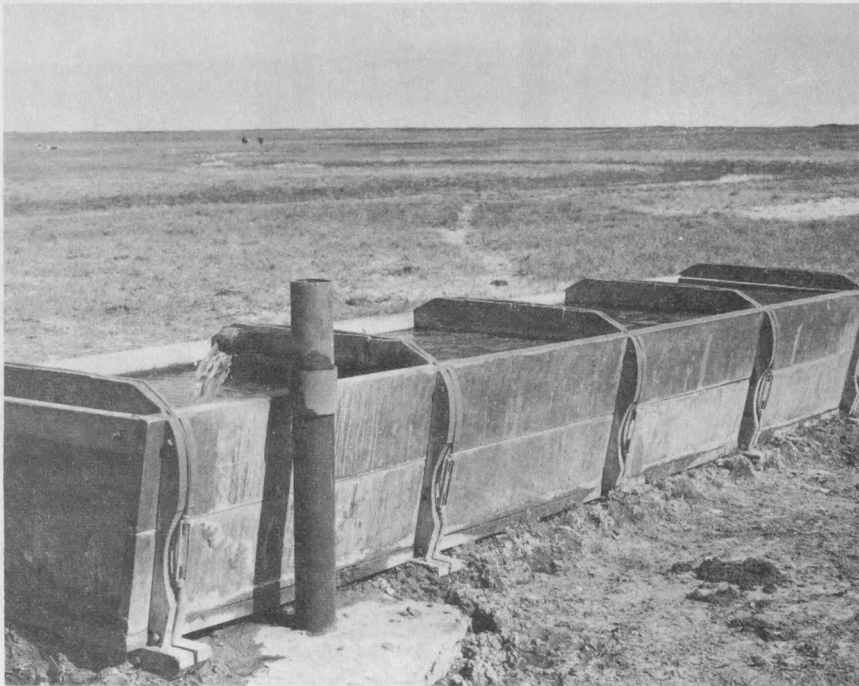
Total number of acres enclosed as at March 31, 1959 - 1,811,985

(X) Acreage of the Wallace Pasture, originally fenced by P.F.R.A., now operated by the Province of Manitoba, has been deleted from the former 1957-58 figure.



A fenced dugout on the Willner Community Pasture in central Saskatchewan.

Ref. No. 17570



A flowing well discovered on the new Mount Hope-Prairie
Rose Community Pasture in central Sask.

Ref. No. 17541

Pasture Improvement

Originally submarginal land turned over to P.F.R.A. to be developed into community pastures consisted of abandoned cultivated farm land or overgrazed rangeland both usually being subject to weed growth and soil drifting. In more recent years requests have been received for the development of community pastures on submarginal parkland in the northern and eastern part of the P.F.R.A. area.

In the developing of a community pasture, P.F.R.A. encloses the proposed area with a fence, regrassess abandoned cultivated land and overgrazed areas, establishes stockwatering facilities such as dams, dug-outs, wells and springs, and constructs a pasture headquarters and corrals. Once in operation, grazing and management policies are followed in all P.F.R.A. community pastures which will ensure the future productivity and efficient utilization of the various areas and characteristics of each pasture.

Crested Wheat Grass has been used extensively for regrassing purposes because of its drouth tolerance and suitability for spring grazing. This latter features makes it ideally suited for use in rotation with native

grasses. Adequate cross fencing is required in order that the livestock can be confined to the Crested Wheat Grass areas until the middle of June after which date the native grasses produce their heaviest yield providing they have been protected earlier in the season.

To encourage even grazing, special care is taken in locating stockwatering sites, salt supplies, and backscratchers as these are major factors in influencing the distribution of cattle throughout the pasture area. Stockwatering sites are located as nearly as possible within two miles of each other on open range and preferably closer in rough terrain or in bush country. Cattle travelling greater distances do not graze the pasture evenly nor do they make normal gains in weight. The salt supplies and backscratchers are located away from the watering sites to encourage the cattle to move away from those areas.

An important factor in preventing overgrazing and in maintaining the pasture grass in a healthy and vigorous condition in P.F.R.A. community pastures, is the policy of maintaining a 50 per cent grass carry-over, wherever it is possible and feasible. This policy also helps stabilize available pasturage during dry periods.

To keep up to date with advances in range management, P.F.R.A. has established a special Pasture Improvement section under the supervision of the Community Pasture Branch. This section plans and carries out an investigational and work program designed, through the application of agricultural and engineering principles, to further increase the carrying capacity and to improve the drouth resistance of grass land in community pastures. This program, which has now extended into 44 pastures, is being developed in close co-operation with the Experimental Farms Service which advises on new methods and procedures and carries out a program of production measurements to determine the effectiveness of the various pasture improvement operations.

In community pastures on the open plains where moisture is the limiting factor in grass production, the Pasture Improvement section is primarily interested in water conservation. The program for these pastures includes a full investigation and development of stockwatering facilities, a study of mechanical soil treatments and the planning and establishing of flood irrigation schemes. In addition, an extensive grass survey was completed in 1958 on eight prairie pastures in southwestern Saskatchewan, on the basis of which comprehensive recommendations were submitted for a systematic fencing and regrassing program to provide more efficient utilization of these pastures.

During the year, 19 dams and 6 dugouts were constructed under the supervision of the Pasture Improvement section. Studies were continued on areas that received previous mechanical treatments such as contour furrows, and surface pitting. Four hundred acres of deep pitting was carried

out in the Masfield and Govenlock Pastures in 1958 to check the effectiveness of this operation. Development work was continued on the 4,000 acres of pasture land in eight flood irrigation schemes located in the pastures of south western Saskatchewan.

The main problem facing the Pasture Improvement section in the community pastures which are located in the northern and eastern portion of park region of the P.F.R.A. area is one of land clearing rather than water conservation. Community pastures in the park area usually contain rough, stoney, or sandy land not suitable for cultivation. When these areas, which are covered by trees and bush interspersed by patches of grass, are protected from grass fires, the bush condition soon invades the whole area. The Pasture Improvement section has used various methods to clear established tree growth in Community Pastures. The most efficient operation has proven to be the use of the ball and chain. During 1958-59 over 1,600 acres



Land clearing operations by the chaining method in the Beaver Hills community pasture in southeastern Saskatchewan.

Ref. No. 16911

were cleared by this method. Rotary cutters were used to clear 600 acres of small trees and bush not over 3 1/2" in stem diameter. When proper conditions prevail, controlled burning has proven a cheap and effective method of controlling bush invasion and regrowth on cleared areas. The extent to which controlled burning is possible has been greatly increased by the use of a Stump Jump plow imported from Australia to establish fireguards through-



Fireguarding by the use of the new Stump Jump plow through bush land in the Woodlands Community Pasture in Manitoba.

Ref. No. 15743

out the park area. During the year over 100 miles of fireguards were established by this machine. In addition to mechanical clearing and burning, herbicidal spraying was used on 152 acres in the Beaver Hills pasture to control regrowth. Other work supervised by the Pasture Improvement section in the parkland community pastures during 1958 included the regrassing of 290 acres, the repair of 2 stockwatering dams, the construction of 9 miles of access road, and the completion of construction work on drainage projects involving 1,950 acres in the Beaver Hills Community Pasture.

REHABILITATION and RESETTLEMENT

Following the severe drouth and depression of the early 1930s many farm families in Western Canada became dependent upon Government and public relief programs for survival. The rehabilitation and resettlement program developed under the Prairie Farm Rehabilitation Act and its 1937 amendment, has been an important factor in re-establishing the farming population in the drough area of the Canadian Prairies.

One of the first steps in the rehabilitation program was to help farmers overcome the immediate problem of farm water supply, by providing financial and engineering assistance in the construction of small dams and dugouts. In this way farmers were able to rehabilitate themselves without the necessity of moving to a new location. To further assist in the rehabilitation program the Government of Canada constructed community irrigation projects in some of the driest areas of south western Saskatchewan. The irrigated land associated with these projects is divided into 40 acre plots and leased to farmers for the production of feed and seed supplies. By providing an assured feed supply, even when drouth conditions prevail, these projects have helped stabilize the agricultural economy of the areas in which they are located.

Where it has not been possible to effect the rehabilitation of farmers on the land they are operating by helping them obtain an adequate farm water supply, or in those areas in southwestern Saskatchewan where community irrigation projects have been developed, by providing irrigated land for the production of a supplementary feed supply, special arrangements have been established whereby farmers may receive assistance in moving to irrigated land in Alberta which has been developed by the Federal Government for resettlement purposes. Following is an account of the progress and development on the irrigation projects constructed in Saskatchewan and Alberta for the rehabilitation and resettlement of farmers throughout the P.F.R.A. area.

Val Marie Irrigation Project

Located on the Frenchman River near the town of Val Marie in southwestern Saskatchewan, the Val Marie Irrigation Project was one of the first irrigation projects built for rehabilitation and resettlement purposes. Water for irrigation on this project is obtained from runoff on the southern slopes of the Cypress Hills. This water is stored in the Cypress Storage Reservoir which is located well up in the Cypress Hills at the headwaters of the Frenchman River. A dam on the Frenchman River near Val Marie provides local storage for the irrigation water used on this project.

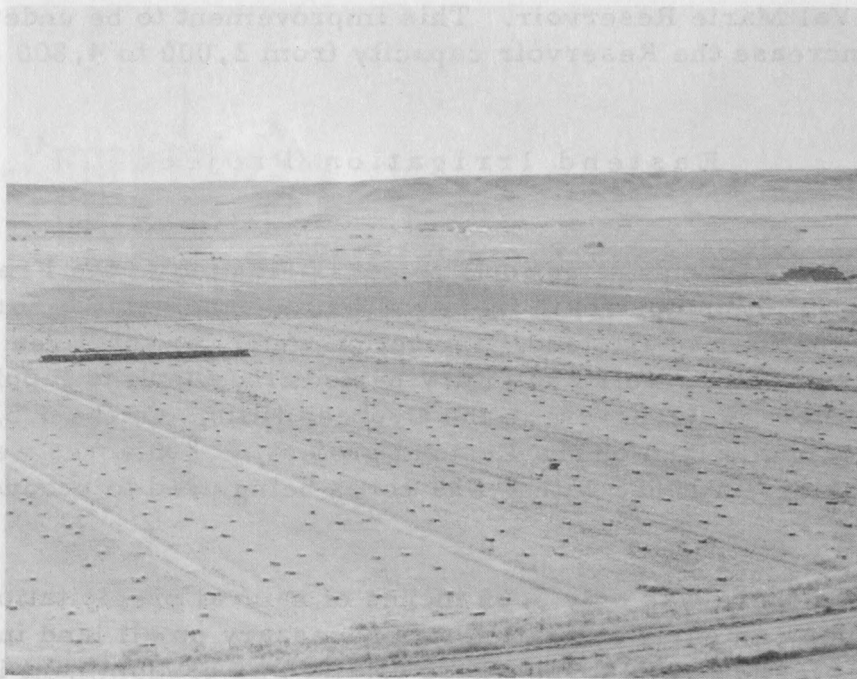
The Val Marie Irrigation Project now has a total irrigable area of 4,635 acres. In 1958, four thousand three hundred and five acres were

irrigated by 70 plot holders with the remaining 330 acres being summerfallowed and levelled. As the natural precipitation during the growing season was only 2.75 inches, a third irrigation was necessary on 1,420 acres of alfalfa hay mixtures that were irrigated early in the season. A total of 6,500 acre feet of water was used for irrigation.

Forage production on the Val Marie Project has increased steadily from an average of one ton per acre in 1954 to 1.8 tons in 1958, resulting in a total production of 7,000 tons of forage crops. This was sufficient to maintain 5,800 cattle which make up the breeding herds of the farmers using the project.

An open winter was experienced up to the end of December 1958 in the Val Marie area and as there had been a considerable carryover of feed from 1957, many plot holders sold supplies of hay to livestock producers in the district whose dry land hay crops had failed as a result of the very dry growing season.

A heavy program of maintenance work to bring the project into good operating condition was carried out during the season. This necessitated the renewing of several large checks and drop structures, and the replacing of several bridges on the main canal which had been in operation for over 20 years. To improve the water supply on the project the live storage in the Val Marie Reservoir was increased by 2,000 acre feet in 1958. The total capacity of the reservoir is now 12,000 acre feet.



General view of the irrigated area on the West Val Marie Irrigation Project.

Ref. No. 13984

West Val Marie Irrigation Project

The West Val Marie Irrigation Project is located on the Frenchman River, west of Val Marie. Irrigation water is obtained from the Cypress Storage Reservoir with local storage being supplied by the West Val Marie dam. The West Val Marie project has a potential irrigable area of 3,500 acres. In 1958 two thousand two hundred and sixty acres were under forage crop production with an additional 400 acres being developed for irrigation in 1959. As a result of the low summer precipitation, 820 acres of early irrigated hay stands required three irrigations. Approximately 4,900 acre feet of water were used during the irrigation season to produce some 4,800 tons of feed averaging 2.2 tons per acre. This was sufficient to supply the winter feed requirements of the 3,500 head of cattle owned by the plot holders.

In addition to regular maintenance work, approximately 350 acres of land along the fringes of the river were scraper levelled using the Parkinson Grid method. This area will be in production and available to settlers in 1959. Two permanent electrically operated pumps powered by one 7 1/2 H. P. and one 10 H. P. motor were installed on the river below the West Val Marie Reservoir to replace the tractor driven pump which has operated for the past six years. These pumps will supply water to 300 acres of irrigable land across the river from the gravity system. During the year surveys were carried out to determine the feasibility of developing a further 850 acres of land on this project.

A contract was let in the late fall of 1958 to replace the spillway of the West Val Marie Reservoir. This improvement to be undertaken in 1959, will increase the Reservoir capacity from 2,000 to 4,800 acre feet of water.

Eastend Irrigation Project

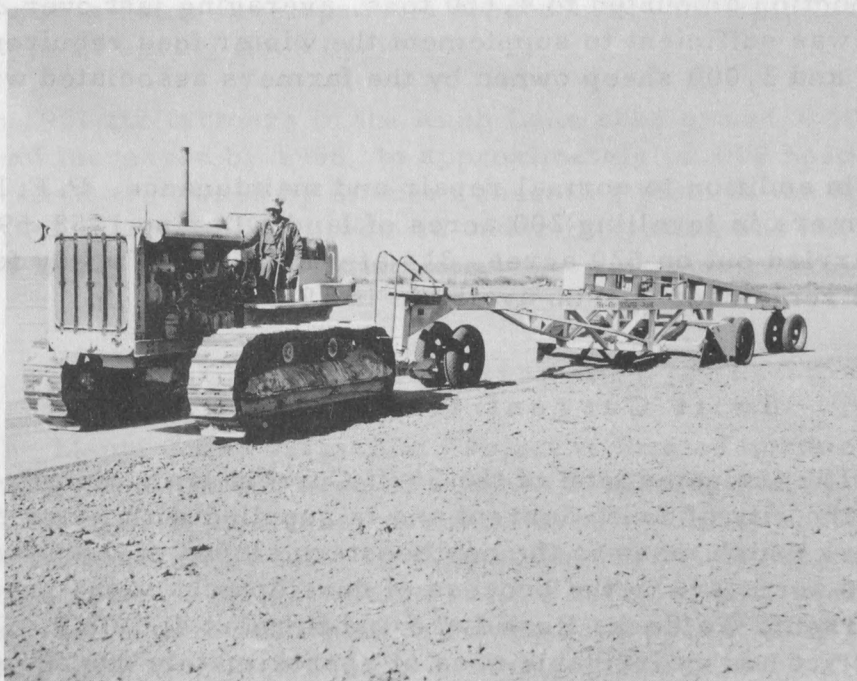
The Eastend Irrigation Project is situated in the Frenchman River Valley about 50 miles upstream from Val Marie, and extends for fifteen miles southeast of the town of Eastend. Irrigation water for this area is supplied from the Eastend Reservoir and in dry periods the supply is supplemented from the Cypress Storage Reservoir in the Cypress Hills. Of the 3,320 acres of potentially irrigable land on the Eastend project, 2,390 acres were operated by 42 plot holders in 1958, with 2,230 acres being used to produce forage crops.

As there was only 3.69 inches of natural precipitation during the growing season, an early irrigation was necessary on all land in forage crop production. On the 1,740 acres where alfalfa was predominant in the hay mixture, a second irrigation was also required. Approximately 4,000 acre

feet of water was used on the Eastend project in 1958. Even though 44 per cent of the second crop was left standing and used for fall grazing, 3,300 tons of feed were produced. This amount was sufficient to supply the feed requirements of the 3,500 cattle and 2,000 sheep owned by the farmers using the project. With an increase of 1,150 acres in the area used to produce forage crops on the Eastend project since 1953, there has been a corresponding increase of 1,700 head in the number of cattle dependent upon the project.

Seepage from sections of the main canal has rendered small areas unproductive with an alkali-salt problem. Four thousand feet of canal were clay lined and improvements in drainage were made to reduce seepage and drainage problems on the project.

During the season, P.F.R.A. developed a new area commonly referred to as the Uglum Extension, which consists of 450 acres of new irrigable land. The canals, lateral ditches, and irrigation structures were all completed to this new area. A system of land levelling and irrigation layouts for a nine unit subdivision were also completed. It is planned to establish these plots in forage crops in 1959. A further 150 acres of privately owned land in this area can be served by this distribution system. By the development of the Uglum Extension, all of the potential irrigable land under the Eastend District can now be fully served.



Land leveling with a scraper plane on the Uglum Extension of the Eastend Irrigation Project.

Consul Irrigation Project

Located in range land in the extreme southwestern part of Saskatchewan, south of the Cypress Hills, the Consul Irrigation Project has made it possible to provide a reliable feed supply in one of the driest areas on the Canadian Prairies. The irrigation water for this project, containing 3,570 acres of land which can be irrigated, is obtained from the Cypress Storage Reservoir through a series of canals. During the 1958 season, 2,860 acres of land were operated by 50 farmers, 520 were being developed and the remaining 170 acres which are relatively rough land of good quality, are to be developed at some future date.

Since 1952 the number of cattle owned by the farmers associated with this project has increased by some 2,600 head. This expanding livestock population resulted not only by the increase in size of individual herds, but also as land was developed for irrigation, a reliable feed supply was made available to a larger number of farmers.

The lack of natural precipitation, which amounted to only 2.65 inches during the growing season, made an early irrigation necessary to assure good forage crop production. In 1958, two irrigations were required on 2,300 acres of the land while 560 acres received only one irrigation. A total of 5,000 acre feet of water was released to the farmers on this project. Forage production amounted to 4,660 tons, averaging just over 2 tons per acre. This was sufficient to supplement the winter feed requirements of the 3,800 cattle and 2,000 sheep owned by the farmers associated with the project.

In addition to normal repair and maintenance, P.F.R.A. crews assisted farmers in levelling 200 acres of land. During 1958-59 development was carried out on 520 acres, 315 of which will be ready for use in 1959 and the remainder will be available in 1960.

Swift Current Irrigation Project

The irrigated land of the Swift Current Irrigation Project is located east of the city of Swift Current and is supplied with water by the Swift Current Creek which rises in the northeastern slopes of the Cypress Hills. About 14,000 acres are in the process of development at the present time in the Swift Current, Waldeck, Rush Lake and Herbert districts. The Swift Current district has an irrigable area of approximately 600 acres of mostly privately owned land. On the Experimental Farm an additional 250 acres are irrigated annually. The Waldeck and Herbert districts are operated by the Conservation and Development Branch of the provincial Department of Agriculture, but they use water supplied to them through P.F.R.A. works.

The Rush Lake Project, which is divided into two areas, North Rush Lake and South Rush Lake, is operated by P. F. R. A. on behalf of the Government of Canada.

The North Rush Lake area has 4,700 acres of developed irrigable land which is divided into 40 and 20 acre plots. On these plots, 154 farmers produced 6,750 tons of feed and 3,200 bushels of coarse grain, using about 5,660 acre feet of water. As a result of the dry season, two irrigations were required on about 40 percent of the land.

A detailed survey completed in 1957 indicated the need of improved drainage. Most of the major drainage improvements were completed in 1958 as well as field surveys for the progressive improvement of the irrigation distribution system. A legal survey of all plots, roads, and canal right-of-ways was completed during the year.

The South Rush Lake area contains 1,700 acres of low lying land which could not be developed under a regular irrigation plan. This area has been developed for a controlled spring flood system. The installation of the necessary structures for water distribution and drainage was completed this year. With partial installation of a few structures in the early spring of 1958, eight hundred acres of this area were controlled flooded.

Some 46 plot holders have annual leases on the South Rush Lake area, and they produced 1,100 tons of feed and 1,800 bushels of coarse grain. Each plot is being developed and seeded into a suitable forage mixture for this type of spring flood operation.

In 1951 the farmers in the Rush Lake area owned 7,000 head of cattle which had increased by 1958, to approximately 12,000 head. Of this number 6,000 head are owned by farmers operating plots in the Rush Lake Project. Surplus feed supplies produced under irrigation are made available to farmers in the surrounding districts.

Maple Creek Irrigation Project

The Maple Creek Irrigation Project is located north of the Cypress Hills in the Maple Creek area of western Saskatchewan. During the past 20 years, P. F. R. A. has constructed reservoirs on the north slope of the Cypress watershed with a total storage of 26,000 ac. ft. of water. This storage supplies water to irrigate some 10,000 acres of land in the Maple Creek District, 4,800 acres of which are owned and operated by the Government of Canada. The irrigated area is comprised of the Maple Creek Flats, west of the town of Maple Creek; the Upper "V" and Lower "V" areas, 20 miles north of Maple Creek; and a large number of private flood schemes located along the various water courses flowing out of the Cypress Hills.

The Maple Creek district is a semiarid region in which chinook winds cause high evaporation. Due to moisture deficiencies and marginal soils, forage crop production through irrigation has become increasingly important as it provides an assured feed supply for the winter maintenance of a large cattle population which thrives in the Cypress Hills to the south and in the Sand Hill area north of Maple Creek during the grazing season. Forage production in 1958 totalled 14,000 tons from 6,500 acres of improved irrigable land and numerous flood meadows. This feed supplements dry land production and serves 136 farm-ranch units carrying 11,000 head of beef cattle.



Haying operations on the Maple Creek Flats showing the placement of dykes on land levelled for border irrigation on Maple Creek Irrigation Project.

Ref. No. 15920

As the watershed does not yield sufficient runoff water to warrant further expansion of the irrigable area in this district, the irrigable lands now in production are being improved so that more feed can be obtained from increased production rather than by increasing the size of the project. In co-operation with the plot holders, efforts are being concentrated on proper levelling of irrigated plots. Lands that have been levelled by the grid method are now yielding 4 1/2 tons of forage per acre. With emphasis on increased production, the Maple Creek Project is becoming an even more vital factor in bringing stability to the agricultural economy in the Maple Creek area.

During the season, sections of sandy canals were clay lined to prevent seepage from occurring and ruining the land adjacent to the canals. A drainage improvement plan was completed in 1958 for 250 acres of water-logged land caused by excess seepage from the main canal. This area showed improvement and will be utilized for pasture and some hay production. The deep pump wells on the "V" projects were in operation for six months. Their purpose is to lower the water table and reclaim lands that contain an excessive amount of alkali salts near the soil surface. Water from three of the pump wells was used for irrigation and supplemented the supply from storage reservoirs.



Pumphouse for deep well pump at Site No. 2 on the Upper "V" of Maple Creek Irrigation Project.

Ref. No. 16070

A program of maintenance was carried out on the project during the season. A new 36" outlet pipe and control tower were installed at Downie Lake Reservoir. The diversion weir for the main canal of Gap Creek was repaired by driving steel sheet piling to stabilize the structure. Several large checks, drop structures and bridges were replaced using pressure-treated material. The structures replaced had been in operation for over twenty years.

Bow River Resettlement Project

Under the Prairie Farm Rehabilitation and Resettlement program, when there is no land available in the surrounding districts, farmers located on submarginal land in or near community pastures are given assistance in moving to irrigated farm land in Alberta. A further qualification for resettlement is that a farmer must be prepared to exchange his dry land holdings of at least 160 acres for the irrigated farm unit he acquires which contains on an average 140 acres of irrigable land. Farmers to be resettled are selected on the basis of need.

To provide irrigated land suitable for resettlement, 27,000 acres in the Hays District of the Bow River Irrigation Project were set aside in 1950 for this purpose. Since 1952 when resettlement began in this area, 189 farmers have been moved on to the project. As the irrigable land in the Hays district is now almost entirely settled, the resettlement program in this area is reaching its final stage of development. During 1958, only five Saskatchewan farm families, two from the Oscar Lake Krydor district and three from the Rosthern-Hague district, were moved to newly developed irrigated land at Hays, Alberta.



A farm house being dismantled by a settler in preparation for moving to the Hays district of the Bow River Irrigation Project.





Ref. No. 16812

BOW RIVER PROJECT

RESETTLEMENT-HAYS IRRIGATION DISTRICT

MARCH 31, 1959

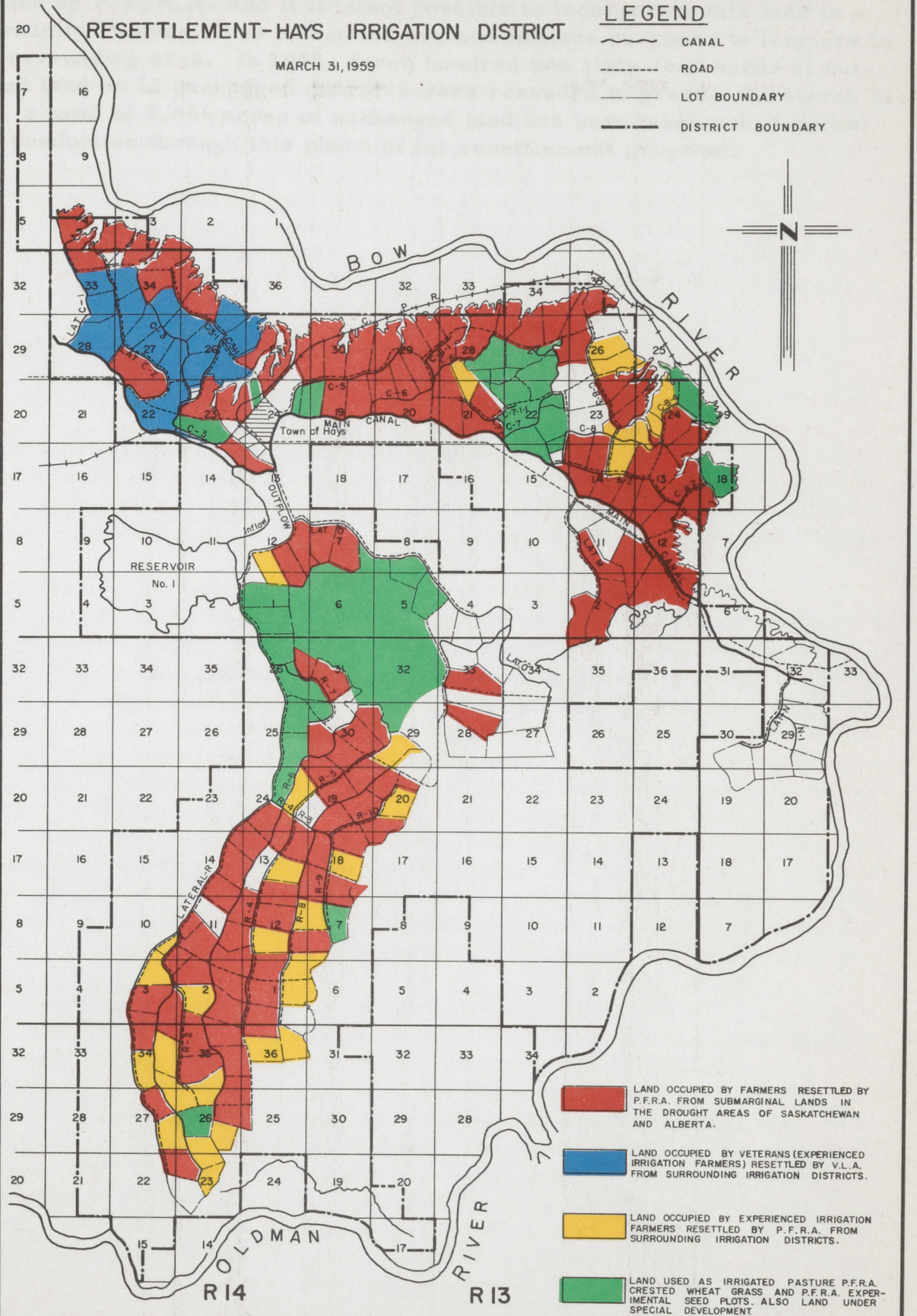
LEGEND

-  CANAL
-  ROAD
-  LOT BOUNDARY
-  DISTRICT BOUNDARY

T 14

T 13

T 12



BOW RIVER PROJECT - IRRIGATION DISTRICT

RESSETTLEMENT AND IRRIGATION DISTRICT

LEGEND

The following table lists the various areas and features shown on the map. The areas are designated by different shades of gray and patterns. The features are indicated by lines and symbols.

Area / Feature	Description
Area A	Area A is the area designated for resettlement. It is shown in solid black.
Area B	Area B is the area designated for irrigation. It is shown in a light gray shade.
Area C	Area C is the area designated for irrigation. It is shown in a medium gray shade.
Area D	Area D is the area designated for irrigation. It is shown in a dark gray shade.
Area E	Area E is the area designated for irrigation. It is shown in a light gray shade.
Area F	Area F is the area designated for irrigation. It is shown in a medium gray shade.
Area G	Area G is the area designated for irrigation. It is shown in a dark gray shade.
Area H	Area H is the area designated for irrigation. It is shown in a light gray shade.
Area I	Area I is the area designated for irrigation. It is shown in a medium gray shade.
Area J	Area J is the area designated for irrigation. It is shown in a dark gray shade.
Area K	Area K is the area designated for irrigation. It is shown in a light gray shade.
Area L	Area L is the area designated for irrigation. It is shown in a medium gray shade.
Area M	Area M is the area designated for irrigation. It is shown in a dark gray shade.
Area N	Area N is the area designated for irrigation. It is shown in a light gray shade.
Area O	Area O is the area designated for irrigation. It is shown in a medium gray shade.
Area P	Area P is the area designated for irrigation. It is shown in a dark gray shade.
Area Q	Area Q is the area designated for irrigation. It is shown in a light gray shade.
Area R	Area R is the area designated for irrigation. It is shown in a medium gray shade.
Area S	Area S is the area designated for irrigation. It is shown in a dark gray shade.
Area T	Area T is the area designated for irrigation. It is shown in a light gray shade.
Area U	Area U is the area designated for irrigation. It is shown in a medium gray shade.
Area V	Area V is the area designated for irrigation. It is shown in a dark gray shade.
Area W	Area W is the area designated for irrigation. It is shown in a light gray shade.
Area X	Area X is the area designated for irrigation. It is shown in a medium gray shade.
Area Y	Area Y is the area designated for irrigation. It is shown in a dark gray shade.
Area Z	Area Z is the area designated for irrigation. It is shown in a light gray shade.



The dry land which is exchanged for irrigated farm units, is re-grassed by P.F.R.A. and if it is not possible to incorporate this land in a Community Pasture, it is leased for hay and pasture purposes to farmers in the surrounding area. In 1958, seven hundred and sixty-four acres of cultivated land on 12 exchanged quarters were reseeded to grass. To March 31, 1959, a total of 3,866 acres of exchanged land has been taken out of cereal crop production through this phase of the resettlement program.

ST. MARY IRRIGATION PROJECT

The St. Mary Irrigation project in southern Alberta was started at the time the country was a simple division on the St. Mary River. The international boundary was built by the Northwest Irrigation Company to bring water for irrigation to lands in the Magrath-Lethbridge region.

Under this plan nearly 150,000 acres of land were developed for irrigation by 1955 but lack of storage facilities caused water shortages to develop particularly during peak irrigation seasons. It was vital that a plan to make full use of Canada's share of the international stream, the St. Mary, Belly and Waterton Rivers, southwest of Lethbridge, and the Milk River in the very southern part of Alberta, would not only remedy the storage problem but also supply water for an additional 150,000 acres of land extending as far east as Medicine Hat. By agreement with the Province of Alberta, the Federal Government became responsible for the financing and construction of the main reservoir and connecting works and for the design and supervision of construction of engineering works throughout the entire project. The Province of Alberta assumed responsibility for the cost of constructing the project distribution system and maintaining reservoirs as well as for general irrigation development and settlement.

The building of the St. Mary Dam, which was completed in 1951, represented the first stage in the development and made possible the extension of the project from the original 150,000 acres to 200,000. The diversion of the Belly River and construction of Riding Reservoir for storage in 1955, was the second stage in development and made possible to supply irrigation to over 200,000 acres. The third and final stage, the construction of the Waterton Dam and diversion canal which began in 1958, will establish an additional storage reservoir and a major diversion of the waters of the Waterton River into the St. Mary Reservoir via the Belly River diversion Canal. This will provide irrigation water for an additional 200,000 acres bringing the total irrigable acreage to 500,000 acres.

MAJOR IRRIGATION and RECLAMATION PROJECTS

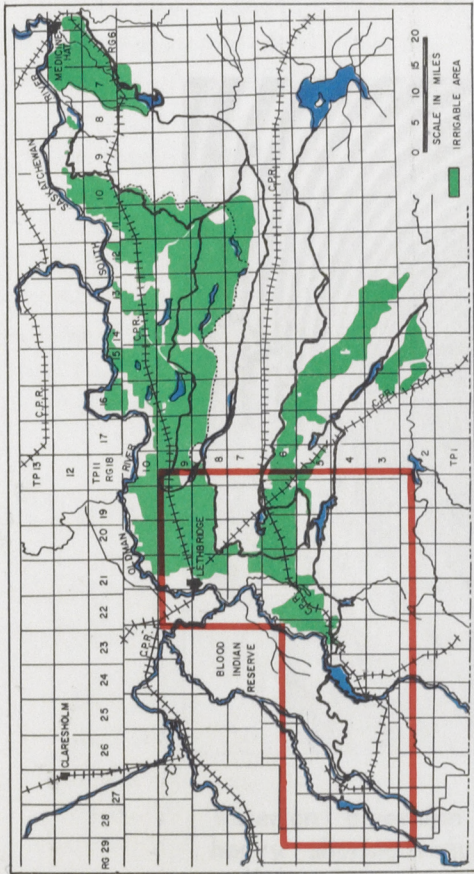
In addition to the Water Development, Community Pasture and Rehabilitation and Resettlement programs which have been established under the terms of the Prairie Farm Rehabilitation Act, the Government of Canada has made special provision in recent years, for the development of large "Irrigation and Reclamation Projects" in Western Canada. These major projects are usually undertaken on a cost-sharing arrangement between the Federal Government and the Provincial Government concerned, and require a special vote of Parliament for authorization.

ST. MARY IRRIGATION PROJECT

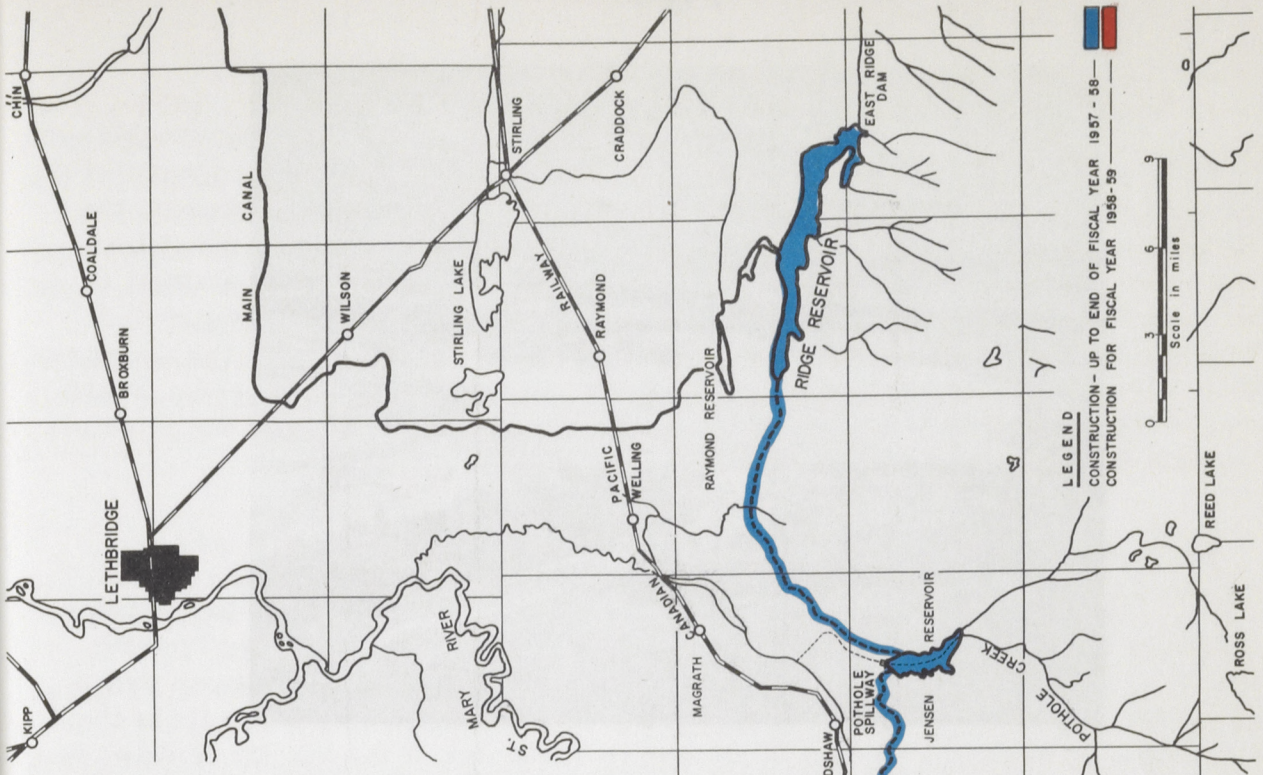
The St. Mary Irrigation project in southern Alberta was started at the turn of the century, when a simple diversion on the St. Mary River near the international boundary was built by the Northwest Irrigation Company to bring water for irrigation to lands in the Magrath-Lethbridge region.

Under this plan nearly 120,000 acres of land were developed for irrigation by 1925 but lack of storage facilities caused water shortages to develop particularly during peak irrigation seasons. It was visualized that a plan to make full use of Canada's share of four international streams, the St. Mary, Belly and Waterton Rivers, southwest of Lethbridge, and the Milk River in the very southern part of Alberta, would not only remedy the storage problem but also supply water for an additional 380,000 acres of land extending as far east as Medicine Hat. By agreement with the Province of Alberta, the Federal Government became responsible for the financing and construction of the main reservoirs and connecting works and for the design and supervision of construction of engineering works throughout the entire project. The Province of Alberta assumed responsibility for the cost of constructing the project's distribution system and balancing reservoirs as well as for general irrigation development and land settlement.

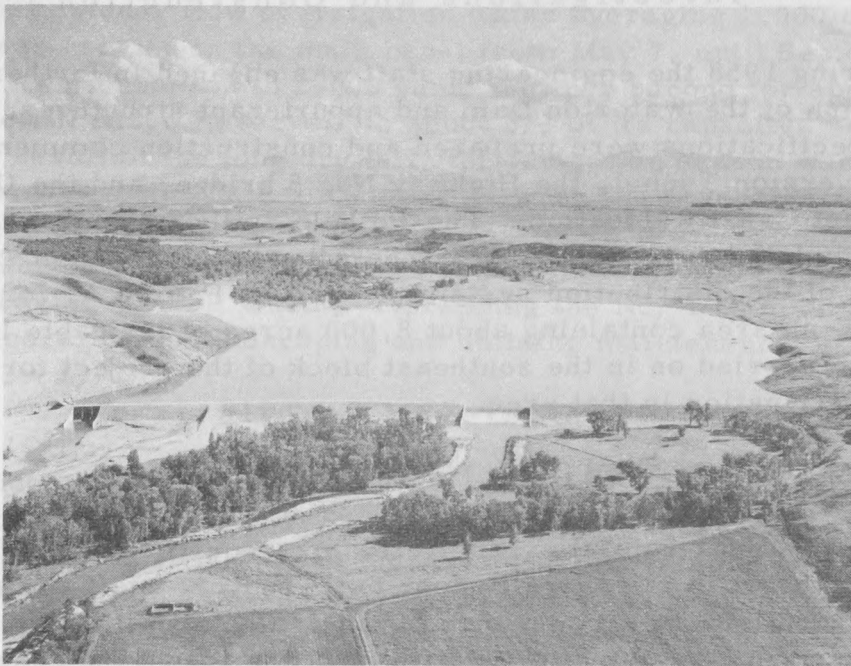
The building of the St. Mary dam, which was completed in 1951, represented the first stage in the development and made possible the extension of the project from the original 120,000 acres of 220,000. The diversion of the Belly River and construction of Ridge Reservoir completed in 1958, was the second stage in development and made it possible to supply irrigation to over 300,000 acres. The third and final stage, the construction of the Waterton Dam and diversion canal which began in 1958, will establish an additional storage reservoir and a means of diverting the waters of the Waterton River into the St. Mary Reservoir via the Belly River Diversion Canal. This will provide irrigation water for an additional 200,000 acres bringing the total irrigable acreage to 500,000 acres.



ST. MARY IRRIGATION PROJECT
GENERAL PLAN



WATER STORAGE AND SUPPLY FACILITIES
PROVIDED BY THE FEDERAL GOVERNMENT



Belly River Diversion Dam and weir showing sluiceway and canal control inlet at the left side of the picture.

Ref. No. 18053



Waterton diversion tunnel under construction. Note the heavy shoring required to retain the tunnel ceiling and walls.

Ref. No. 18066

Investigations and Construction

During 1958 the engineering staff was engaged in further investigation and design of the Waterton Dam and appurtenant structures. Contract plans and specifications were prepared and construction commenced on the Waterton Diversion Tunnel, the Highway No. 5 bridge, and the United Irrigation District Canal Relocation. The Pothole Spillway contract started in 1957 was completed during the year. The Alberta Government completed construction of the distribution system planned by P.F.R.A. for the Cameron Ranch Tract, an area containing about 8,000 acres of irrigable land. Field surveys were carried on in the southeast block of the project for the possible extension of irrigation in that area.

Project Improvement

Where minor capital expenditures are required to make alterations or additions, the work is generally done by P.F.R.A. staff and equipment engaged in operation and maintenance of the project. In 1958 an open drain was constructed in Division 3 to reclaim land damaged by seepage from the main canal, pressure grouting of the north abutment of the St. Mary Dam was completed, and a portion of timber catwalk in the St. Mary Diversion tunnel was replaced with concrete. Other improvement work in 1958 included the construction of Texas gates on the Belly River diversion canal, and graveling of a roadway on one bank of the main canal from St. Mary Dam to the Ridge Reservoir. Grass was seeded on the dams and dykes associated with Ridge Reservoir and along the Belly River diversion canal as well as in the Belly River weir area.

Operation and Maintenance

During the year heavy timely showers reduced the demand for water. This, coupled with full downstream reservoirs in the spring, resulted in less water being delivered in 1958 than in 1957. With increasing acreages of specialized crops which require more moisture than that received even during the heaviest natural rainfall years, regular irrigation has become a more vital factor in the successful production of these crops.

The following table shows the development of the Project since 1952:-

Season	New works constructed to serve	Old districts Served approximately	Water delivered to a total of	Water delivered acre feet
1952	37,000 ac.	118,000 ac.	130,000 ac.	186,000
1953	54,000 "	118,000 "	135,000 "	196,000
1954	96,000 "	118,000 "	158,000 "	246,400
1955	141,000 "	118,000 "	159,700 "	190,000
1956	168,000 "	118,000 "	149,000 "	202,430
1957	176,000 "	120,100 "	169,900 "	314,492
1958	176,000 "	120,100 "	178,000 "	272,132
1959	184,000 "			

A fairly steady flow of irrigation water averaging 1,000 cubic feet per second, was carried in the main canal from May 7, until September. The flow was then increased to 2,000 cubic feet per second for approximately three weeks to fill Ridge Reservoir to about 2/3 of its capacity.

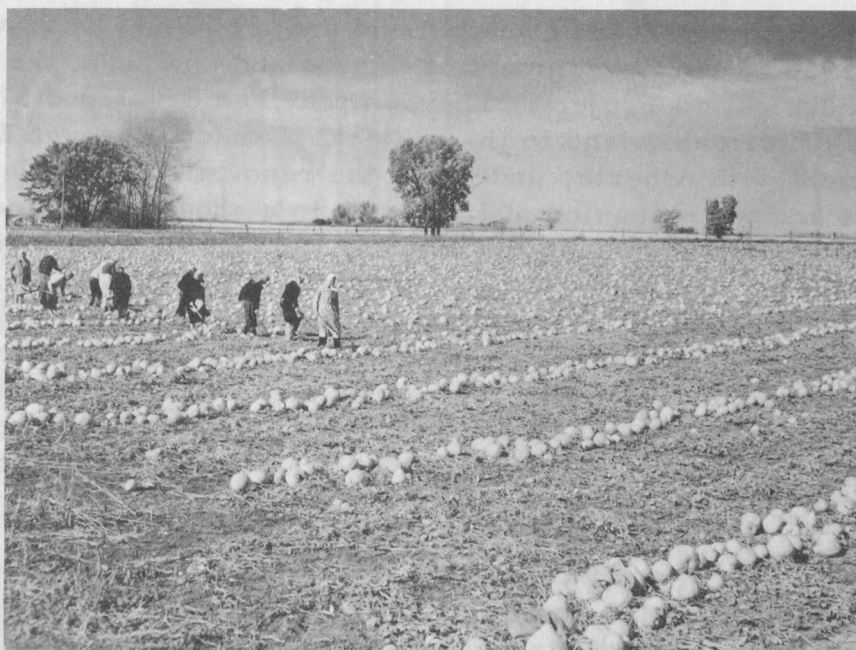
As a result of the long dry fall, the irrigation season was extended beyond its normal closing date to October 27 when the headgates at the St. Mary Dam were closed for the 1958 season.

Maintenance work was confined to placing waterstop in two of the joints in the Taylor Coulee Chute, riprapping the No. 1 Dam on the Main Canal, and general camp landscaping and building maintenance.

Agricultural Development

The ideal growing conditions in 1958 combined with the use of irrigation water produced record crops in the irrigated areas. The average yield of sugar beets in 1957 and the highest experienced up to that time was 13.43 tons per acre. In 1958 the average yield increased to almost 16 tons per acre producing a total crop of approximately 150 million pounds of sugar with a return to the farmers of over 8 million dollars. The acreage of irrigated land devoted to specialized crops is gradually increasing. The following table shows the development taking place in the Lethbridge area:-

	1957	1958
Green vegetables	1,200 acres	1,500 acres
Potatoes	4,800 "	5,500 "
Canning vegetables	8,000 "	10,000 "
Sugar beets	38,000 "	38,000 "
Sunflower seeds		1,000 "



Harvesting squash on a specialized farm north of Coaldale on the St. Mary Irrigation Project.

A new industry to the Lethbridge area, oil seed processing, commenced operations in 1958. A pilot crop of some 4,500 acres of sunflower seed was grown in the area, of which 1,000 acres were irrigated. Yields on irrigated land were up to 2,000 pounds per acre as compared to dry land yield of 800 to 900 pounds. The industry is attempting to contract 150,000 acres of sunflowers for 1959 with 120,000 acres being on irrigated land.

Livestock production showed a further increase during 1958 and is becoming one of the most important sources of income in irrigated areas. Livestock sales at the Lethbridge stockyards for the past four years are as follows:-

<u>Year</u>	<u>Cattle</u>	<u>Calves</u>	<u>Hogs</u>	<u>Sheep</u>	<u>Percentage increase over previous year</u>
1955	46,815	10,008	55,863	12,094	
1956	54,735	12,048	61,155	12,595	12.7
1957	69,035	14,380	65,389	13,918	15.8
1958	63,282	17,583	89,810	13,769	13.4
1958 (x)	29,990	3,901	39,026	21,315	

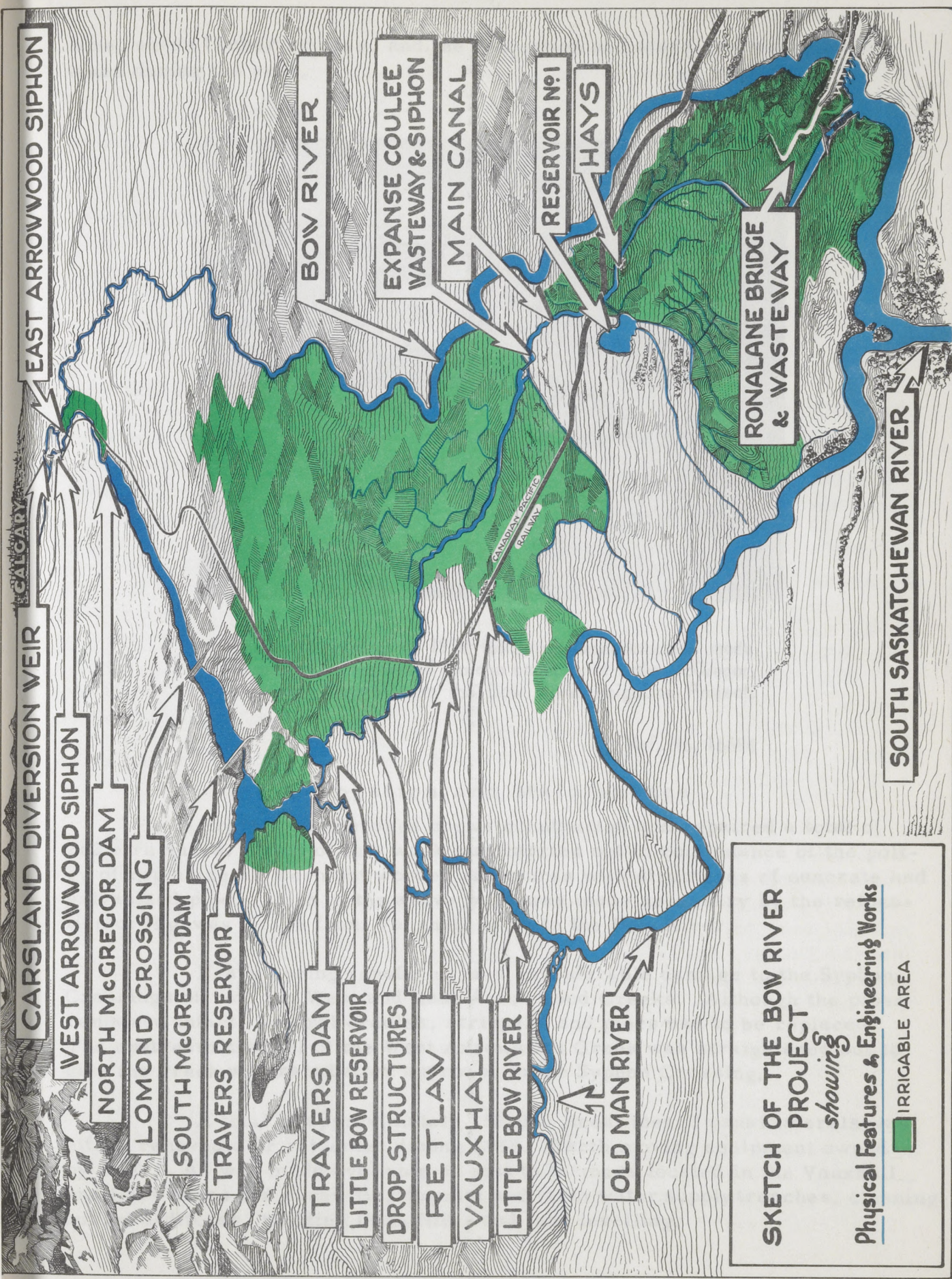
(x) These figures represent "through sales" which are made elsewhere but pass through the Lethbridge yards. This is an indication of the heavy sales to United States buyers.

BOW RIVER IRRIGATION PROJECT

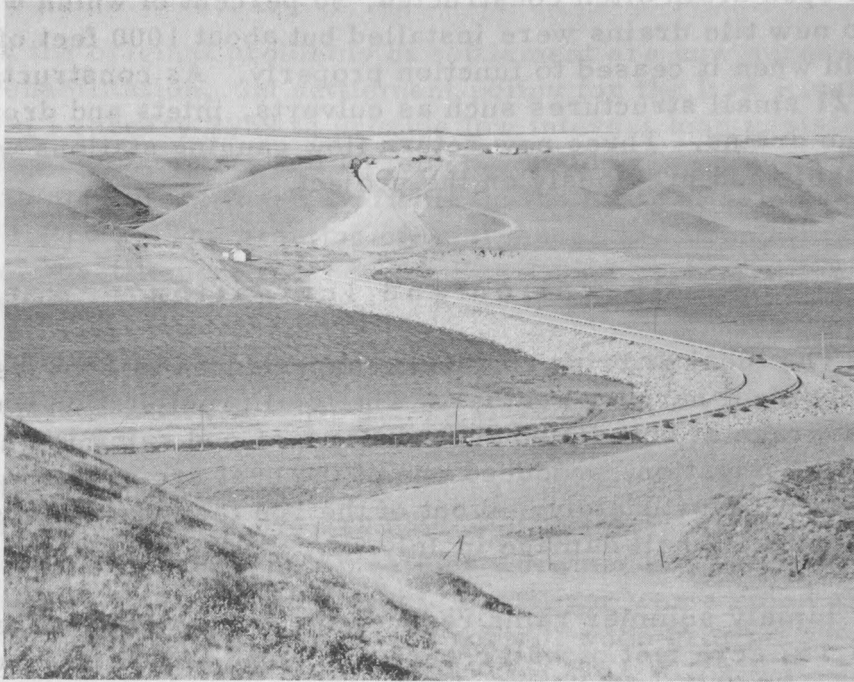
The holdings of the Canada Land and Irrigation Company were purchased in 1950 by the Government of Canada and now form the basis of the Bow River Irrigation Project. The Company had developed 57,000 of the 240,000 acres of irrigable land in the project. Canada, through P.F.R.A. and by agreement with Alberta, undertook the renovation and enlargement of existing works and the extension of irrigation to a greater acreage. The work of renovating and enlarging the existing works is now almost completed. About 8,000 acres in the West Block is currently being developed for irrigation by the Province with the assistance of the P.F.R.A. engineers who plan and design the irrigation structures and prepare the necessary specifications for construction. Some 27,000 acres of new land have been developed by Canada in the Hays District. The remaining 76,000 acres are in the East Block, the development of which will be the responsibility of Alberta

Construction

The construction work on Lake McGregor, which consisted of raising Lomond Crossing and strengthening the South Dam, was completed during the year. The construction of Drop 7A continued through 1958 and should be completed early in 1959. In addition, one concrete check-structure



ture, seven timber bridges, and the relocation of Lateral 'A' were undertaken during the year.



Lomond Crossing in 1958 following reconstruction made necessary by increased storage capacity of Lake McGregor, a storage reservoir on the Bow River Irrigation Project.

Ref. No. 16694

Renovation and Maintenance

Project maintenance crews constructed and repaired a total of 262 structures. Most of this work was carried out in continuance of the policy of replacing all worn out wooden structures with structures of concrete and galvanized pipe. Much of the above work was made necessary by the relocation of Highway No. 36 from Vauxhall north to the Bow River.

Heavy spring runoffs caused considerable damage to the Syphon Crossings on both the West and East Arrowwood Creeks. Although the pipes remained intact, several cradles, stringers and piers had to be replaced. The upstream channel of the West Arrowwood Creek was straightened out to give the creek waters a better approach to the Syphon Crossing.

A total of approximately 350,000 lineal feet of canal laterals was either renovated or relocated during 1958. Earth moving equipment owned by P. F. R. A. was made available at cost to farmers located in the Vauxhall and Hays areas for excavating dugouts and farm water supply trenches, cleaning out head-ditches, building farm fills, and land levelling.

Drainage

The drainage improvement program was continued in 1958 with 25 miles of open drain ditch constructed, 90 percent of which were shallow drains. No new tile drains were installed but about 1000 feet of tile drain were re-laid when it ceased to function properly. As construction progressed some 121 small structures such as culverts, inlets and drops were installed in the drains. Three new return flow gauging stations were added to the four established previously on the project.

Operation and Irrigation

The ideal growing conditions experienced in 1958 were followed by practically ideal harvest weather. The total precipitation was above the long-term average at both Vauxhall and Hays. Good rains in June and July combined with irrigation, produced one of the best crops ever experienced in these areas. Unfortunately, 40 out of the 160 farmers at Hays suffered from 80-100 percent hail damage in July.

Timely summer rains reduced the irrigation requirements. Whereas 78,157 acre feet of water were delivered to 634 farm units in 1957, six hundred and forty eight farm units received only 69,121 acre feet in 1958. In the Hays area 9 parcels received water for the first time. Water was turned into the main canal on May 4 and discontinued on October 20. About 1/3 of the total flow of 104,850 acre feet was lost through seepage and evaporation or returned to the rivers through wasteways. Water was again delivered to the Bow River Development acreage in the Enchant and Travers areas. They received a total of 3,809 acre feet during 1958 which was about a 20 percent increase over previous years.

The main canal from the Bow River carried a flow of 800 c. f. s. from June 27 to October 15. During that time 150,155 acre feet of water were diverted from the Bow River to Lake McGregor. Due to the high natural spring runoff received in the Travers Reservoir from the Little Bow River in 1958, only 75,000 acre feet of water were diverted from Lake McGregor into the Travers Reservoir. The remainder was retained in Lake McGregor increasing the year-end storage to 208,500 acre feet as compared with 130,000 acre feet in 1957.

Resettlement

The policy of resettling farmers from submarginal prairie farms, veterans, and experienced irrigators from other areas on land in the Hays Irrigation area was continued during 1958. Twelve farm units in this area were allocated during the year. Under the P.F.R.A. policy of assisting settlers to become established, 6,400 bushels of seed grain, 500 pounds of

pasture mix seed, and 3000 pounds of Vernal alfalfa were distributed to farmers on the project. The seed grain is supplied on the basis of 2 bushels of threshed grain for each bushel of seed grain received, while forage seed is distributed at cost.

As the original problems of settlement are now superseded by problems of rehabilitation, the settlement policy for the Bow River Project was amended in February 1959 to provide low interest loan assistance for the purchase of fencing materials and livestock. In addition, Crown Lands developed for settlement were made available on the basis of sale at prices prevailing in the district. The granting of trial leases has been eliminated. For more details of resettlement refer to the Bow River section of the Rehabilitation and Resettlement Program of this report.

Pastures

The irrigated pastures at Vauxhall carried 1,051 head of cattle from May 15 to October 5, a grazing period of 143 days. Rotational grazing was practiced and frequent light irrigations were used to increase carrying capacity and maintain good grass cover. Fertilizer was applied and spraying was carried out to improve the stand and control weed growth.

The East Hays Pasture, containing 1,100 acres, of which 285 are irrigated, carried 350 cattle from May 10 to October 14. The cattle came off in good shape and the pasture held up well. One hundred and thirty acres of dry land in this pasture were seeded to crested wheat grass and alfalfa. This area will provide spring pasture each year until the growth on the 285 acres of irrigated tame pasture is ready for grazing.

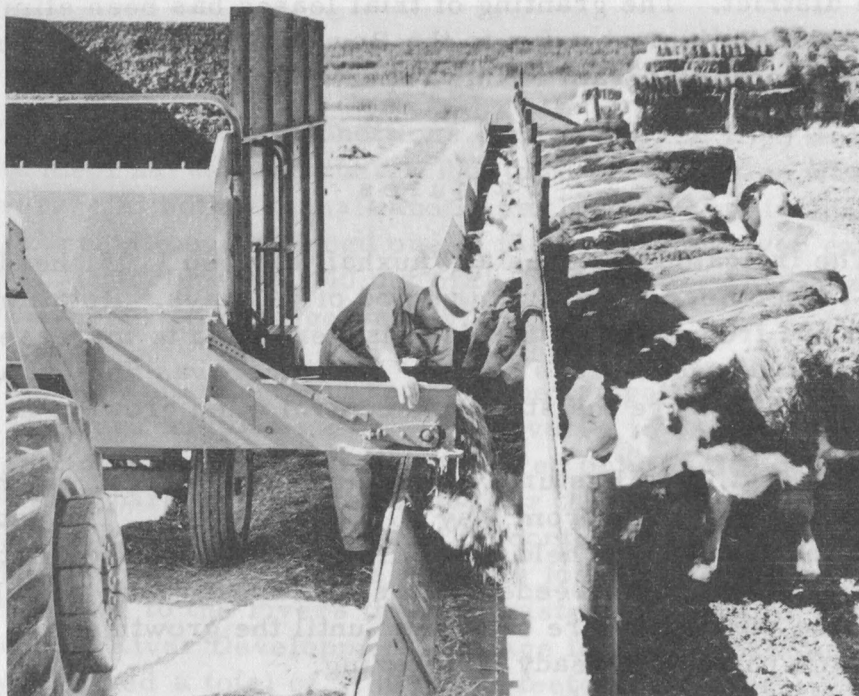
The new 3,210 acre sheep pasture south of Hays was closed to grazing during 1958 to allow the native grass to recover after many years of overgrazing. Development work on 538 acres of irrigable land in the pasture was completed in 1958.

Agricultural Development

The grain harvest was about average in the Hays district. Specialty crops such as potatoes, turnips, carrots, tomatoes and beans were grown in the 1958 season on a trial basis. Problems experienced in this type of production are being gradually overcome. Livestock production continues to be a valuable source of farm income. Cattle feeders experienced a profitable year and hog producers supplied regular weekly shipments to the Calgary market. More settlers are now finishing their cattle and lambs before marketing them. This trend has been encouraged by the formation in 1958 of the Hays Feeder Association, an organization which will make loan capital available for livestock feeding. Approximately 2,000 lambs and 150 cattle

are on feed in the Hays district this winter.

A mechanical grazing demonstration was undertaken in 1958. Forty head of cattle were finished on the production of grass from 17 acres of irrigated land. The cattle were confined and the feed was cut and hauled to them twice daily. This experiment provided some interesting results and is expected to be continued with a few modifications.



Freshly cut greenfeed being fed to livestock in a mechanical grazing experiment undertaken near Hays, Alberta on the Bow River Irrigation Project.

Ref. No. 18023

A program to control weed growth along the canals and road allowances has been established by P.F.R.A. Under this program 300 acres of land in the Hays district, and the entire distribution and drainage systems in the Vauxhall area were sprayed, using 2-4-D volatile ester. Additional spraying was undertaken in weed infested areas on the project. Fall spraying to control regrowth on areas sprayed in June was done on an experimental basis in October.

SOUTH SASKATCHEWAN RIVER PROJECT

In July 1958 an agreement was signed between the Province of Saskatchewan and the Federal Government, authorizing the construction of the South Saskatchewan River Project, a large multi-purpose water conservation project on the South Saskatchewan River in south-central Saskatchewan. The purpose of the project is to develop the water resources of the river for irrigation, power development, flood control, streamflow regulation, urban water supply, and recreation. Control of the river will be achieved by the construction of two dams, the major one on the South Saskatchewan River midway between the towns of Elbow and Outlook, the other southeast of Elbow at the summit between the valleys of the South Saskatchewan and Qu'Appelle Rivers.

The agreement provides that Canada and Saskatchewan will share the cost of building the above structures and all other works associated with the creation of the reservoir. Seventy-five percent of the cost is to be borne by Canada and twenty-five percent by Saskatchewan, with Saskatchewan's share not to exceed \$25,000,000. The contribution of the Government of Canada toward the cost of the project is in accord with its long range resources development plan to provide for expansion and stability in Canada's growing economy.

Surveys and investigations to determine the feasibility of this project were first undertaken by P.F.R.A. in 1943. Sites were investigated throughout a 100 mile stretch of the river from Outlook to a point north of Swift Current. Topography and the location of materials led to the selection of site 10 some 18 miles upstream from Outlook.

Construction

Eight contracts totalling approximately six million dollars were awarded from October 1958 to March 31, 1959. During the fall and winter months construction was advanced on four of these contracts. The east access road was practically completed by the end of 1958. Work on the contract for processing the concrete aggregate required during construction period, started in the spring of 1959. The water, sewer and street services for the construction headquarters were almost completed by the end of the fiscal year. Construction on the forty housing units and five headquarters buildings continued throughout the winter of 1958-59 with the completion date of the contract being June 30, 1959. Work on the construction bridge substructure was carried on during the winter months with Number 2 and 4 piers, and the west abutment being completed by the end of March. No work was done on the first stage of the east embankment, the north access road, or the wellpoint water supply contract during the 1958-59 season.



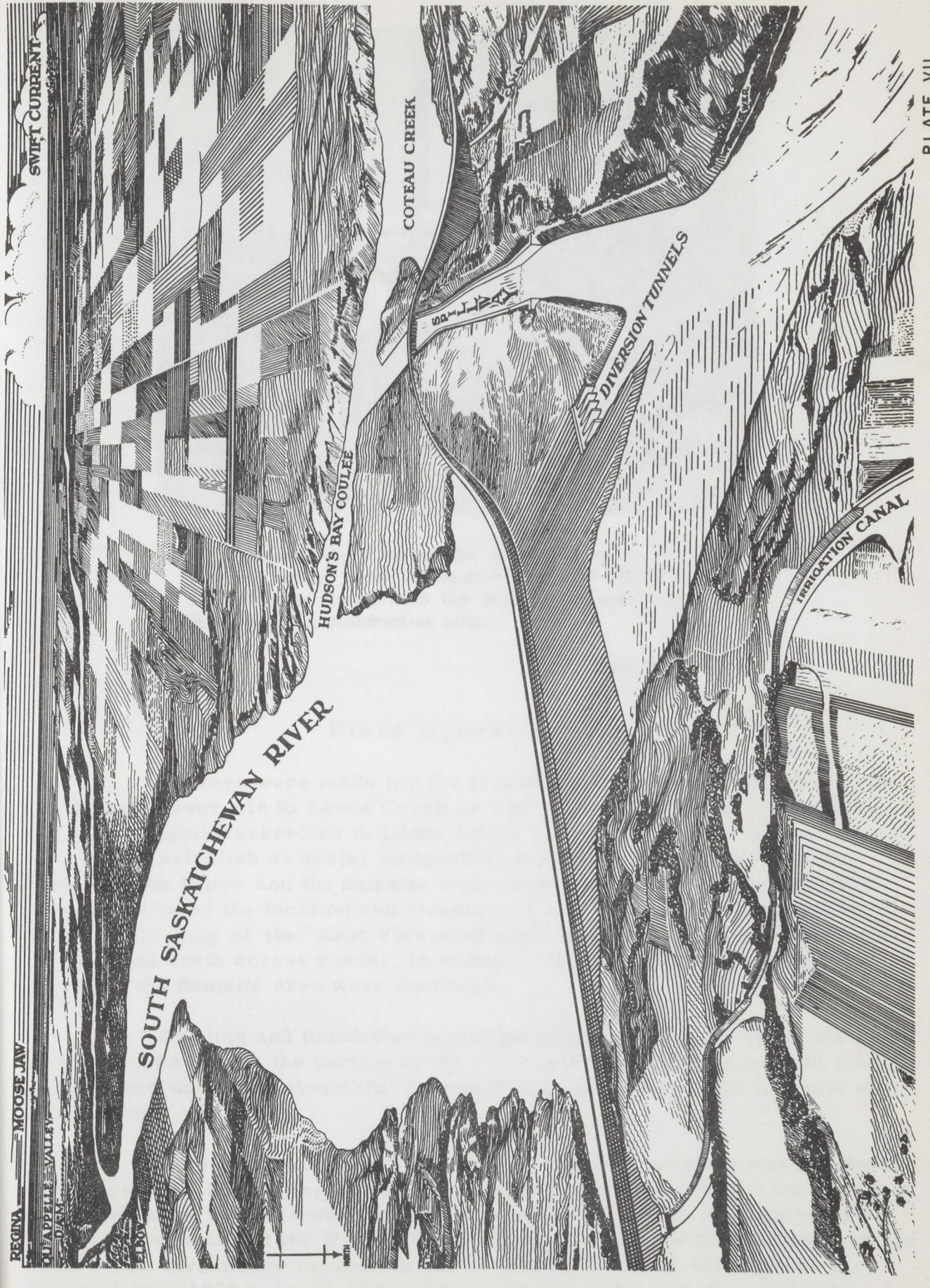
Winter construction of P.F.R.A. headquarters at the South Saskatchewan damsite showing the east access road in the background.

Ref. No. 17100

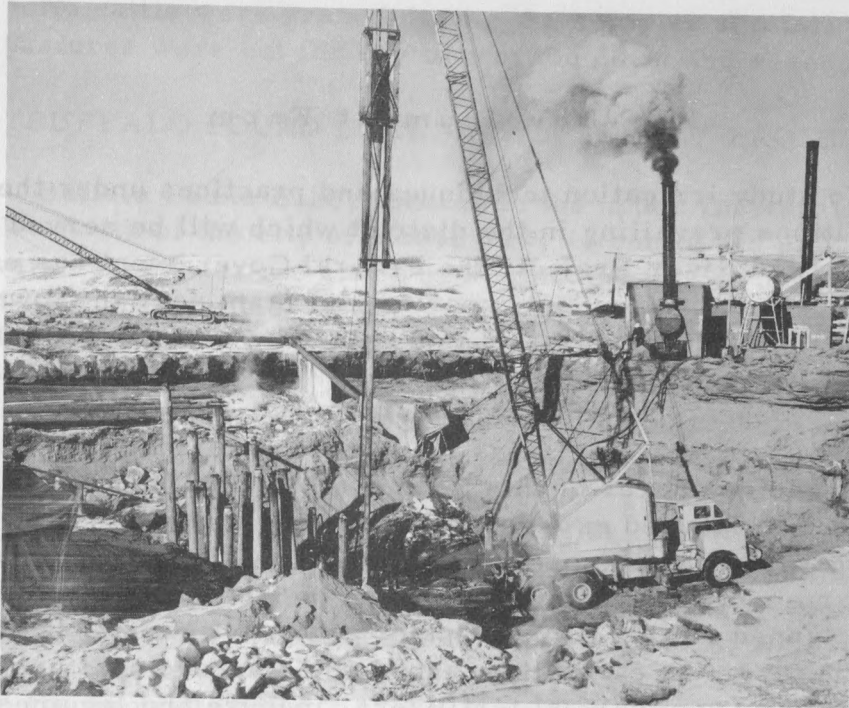


House construction during the winter of 1958-59 at P.F.R.A. construction headquarters, South Saskatchewan damsite.

Ref. No. 17130







Jetting foundation piles for the west abutment of the construction bridge which is located about the centre of the Saskatchewan River. Note the sandpoint system used for dewatering the construction area.

Ref. No. 17121

Field Operations

Surveys were made for the location of a possible canal line from Blackstrap Reservoir to Lewis Creek as well as possible future irrigation and water supply reservoirs in Lewis Creek area. The basic information required to establish an aerial topographic mapping of the main reservoir area between Elbow and the damsite was completed during the year. Other surveys included the location and elevation of 1,000 bore holes, a large-scale topographic map of the East Viewpoint area, and right-of-way surveys for the east and north access roads. In addition, the construction surveys required in the damsite area were continued.

Drilling and foundation investigations were carried out in the east embankment area, in the portion of the river bed which will be beneath the embankment and at all structural locations and borrow areas on the west side of the river.

A revised program of streamflow and silt sampling was instituted in the spring of 1958. Regular streamflow measurements, sediment sampling and gauge readings were recorded at Outlook. Water level elevations were also recorded at the P.F.R.A. pumphouses at Elbow from July to October 1958. The streamflow measurements at Outlook showed the highest discharge during 1958 to be 37,113 c.f.s. in April, with a low flow of 5,097 c.f.s.

in September.

Pre-Development Farm

To study irrigation techniques and practices under the soil and climatic conditions prevailing in the district which will be served by the South Saskatchewan River Project, the Federal Government has established a pre-development irrigation and experimental farm near the town of Outlook, Saskatchewan. Water for irrigation is obtained by pumping from the South Saskatchewan River near Outlook.

The farm which contains 171 acres, is divided into two parts. Approximately sixteen acres of this farm are operated by the Experimental Farms Service for detailed experimental work on irrigated crops and soils. The remaining 155 acres are operated by P.F.R.A. to demonstrate on a field scale, farming practices and irrigation methods feasible in that area. Irrigation is planned so that both sprinkler and gravity methods of irrigation are used on the farm. A carefully planned soil improvement program using a ten-year rotation, commercial fertilizers, manure and legumes, has resulted in a steady improvement in crop yields since the program was first started.

In 1958, pumping for irrigation commenced on May 8 and ended in September with about 6 percent more water being pumped than in the previous year. Not considering losses from leakage, seepage and evaporation, there was an average of 16 inches of water used on the farm during the season. Rainfall during the same period was 8.1 inches, almost 2 inches more than in the 1957 season.

The basic crop rotation was adhered to with the exception of one field of brome grass-alfalfa mixture which winter-killed in the winter of 1956-57. This field was not reseeded to brome grass-alfalfa but instead to Garry oats in 1958 and will be seeded to wheat in the spring of 1959 to start the basic rotation again.

Farm yields for 1958 and previous years were:

Crop	<u>Yield per acre</u>			
	<u>1955</u>	<u>1956</u>	<u>1957</u>	<u>1958</u>
Hay	2.1 tons	3.4 tons	3.1 tons	3.5 tons
Oats	51 bus.	88 bus.	89 bus.	97 bus.
Barley	39 bus.	57 bus.	51 bus.	58 bus.
Wheat	32.8 bus.	48 bus.	33 bus.	50 bus.
Potatoes	415 bud.	407 bus.	250 bus.	270 bus.

No cattle were grazed during the summer and fall of 1958, instead the pastures were cut for hay or worked down and reseeded.

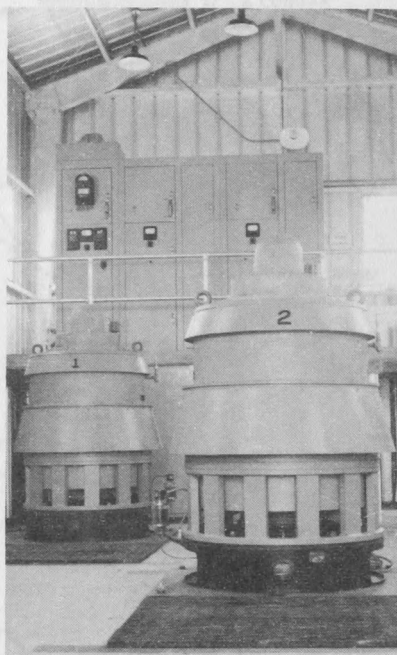
BUFFALO POUND LAKE WATER SUPPLY PROJECT

Buffalo Pound Lake, located in the upper Qu'Appelle Valley about twenty miles north of the city of Moose Jaw, is one of the principal sources of urban water supply for the cities of Regina and Moose Jaw. Through an agreement with the Province of Saskatchewan, the Government of Canada has accepted the responsibility for maintaining the water level of the Buffalo Pound Lake Reservoir. This project will become an integral part of the South Saskatchewan River Development when the South Saskatchewan Dam is completed.

Pending construction of the South Saskatchewan River Dam, the level of Buffalo Pound Lake is to be maintained by supplementing the flow of the Qu'Appelle River. Works were begun in 1955 for the pumping of some 90 c. f. s. of water from the South Saskatchewan River at Elbow, a vertical distance of 107 feet, into a high level canal which carries this water some 12 miles to the summit of the Qu'Appelle Valley. The second part of this project was to improve the flow conditions of the Qu'Appelle River between the summit of the Qu'Appelle Valley and Buffalo Pound Lake, a distance of 48 miles. Construction of this project was completed in June 1958.



Pumphouse No. 2 and reservoir canal with overflow on the left and the two 36" discharge pipes in the foreground.



Interior of Pumphouse No. 1 showing the two 350 H.P. motors and controls.

In 1958-59 two pumping tests were carried out to check for operational problems. The following improvements to the pumping and conveyance systems were made during the fiscal year; 1,500 cubic yards of gravel were placed around the structures and on the access roads, "Hydrauger" drains were installed below No. 1 Outlet Structure to collect seepage, 28,500 cubic yards of material were excavated from "Old Baldy" to reduce the slide hazard to the canal near No. 1 Pump Site, and control of weed growth along the canal. Maintenance of Buffalo Pound Reservoir impounding works consisted of replacing the natural willow which had been destroyed, with gravel and rock rip-rap for bank protection and the repairing of cables and cable fastenings at the No. 2 Outlet Control Structure.

Crop

Hay

Grain

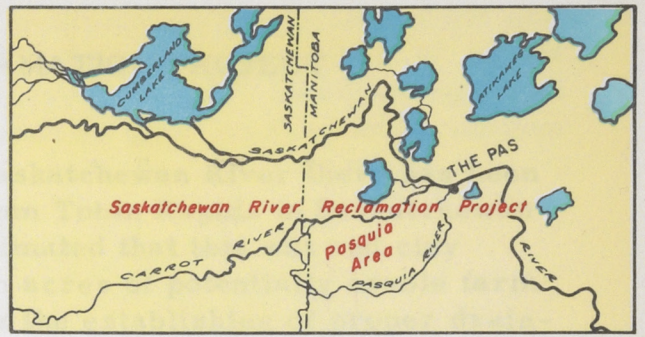
Vegetables

Other

Unplanted

Ref. No. 17148

Ref. No. 17147



INSERT AREA LOCATED 50 MILES NORTH OF PORCUPINE FOREST RESERVE

DEPARTMENT OF AGRICULTURE - CANADA

P.F.R.A.

SASKATCHEWAN RIVER RECLAMATION PROJECT

Along the lower course of the Saskatchewan River there has been built up an extensive delta area reaching from Tobin Rapids in Saskatchewan to Cedar Lake in Manitoba. It has been estimated that this silt and clay delta contains about one and one half million acres of potentially arable farm land. The reclamation of this land requires the establishing of proper drainage facilities and flood prevention works.

Investigations began in 1950 to determine the feasibility of reclaiming portions of the Saskatchewan River delta. By joint agreement between the Federal and the Manitoba Governments, P.F.R.A. in 1953 undertook the actual development of the "Pasquia Area" located southwest of The Pas between the Carrot River and the Pasquia River, as a pilot project. In this area, containing some 135,000 acres, it is expected to reclaim approximately 110,000 acres of arable land. The experience gained in the Pasquia Area will provide a valuable guide should it be decided to develop other areas throughout the remainder of the delta region.

Sipanok Area

A topographic survey program of the Sipanok Area was completed in 1957. Annual hydrometric surveys to study the rate of discharge of water and sediment into and through the Saskatchewan River Delta between Tobin Rapids and The Pas, provide information essential to the possible reclamation plans and also supply data valuable in the operation of the Pasquia Project.

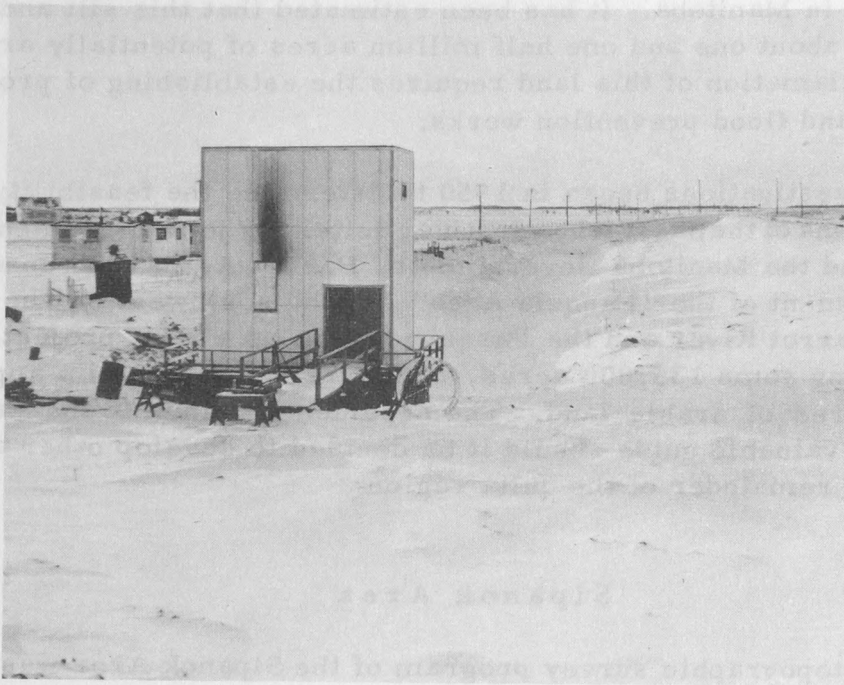
Pasquia Area

Since development began in the Pasquia Area in 1953, dykes have been established along the Carrot and Pasquia Rivers, a drainage system is now almost completed, and a network of roads to service the area is being constructed. During the year, construction, investigation and development surveys were carried out to supply the required information needed for the establishment of 30 miles of drains and 50 miles of roads.

Construction

Pasquia Drainage Contracts No. 2 and No. 3 were completed in 1958. These contracts were for the construction of the drains, dykes and controls necessary to carry the drainage water gathered in the northeast portion of the project to Pumping Plant No. 2 which is located at the Control Dam on the Pasquia River near The Pas, Manitoba. Construction of Pumping Sta-

tion No. 2 commenced on November 1, 1958 and is to be completed before March 31, 1959. Work started in December 1958 on the fourth and final drainage contract. This contract, to provide for drainage in the western section of the project, is to be completed by June 30, 1959.



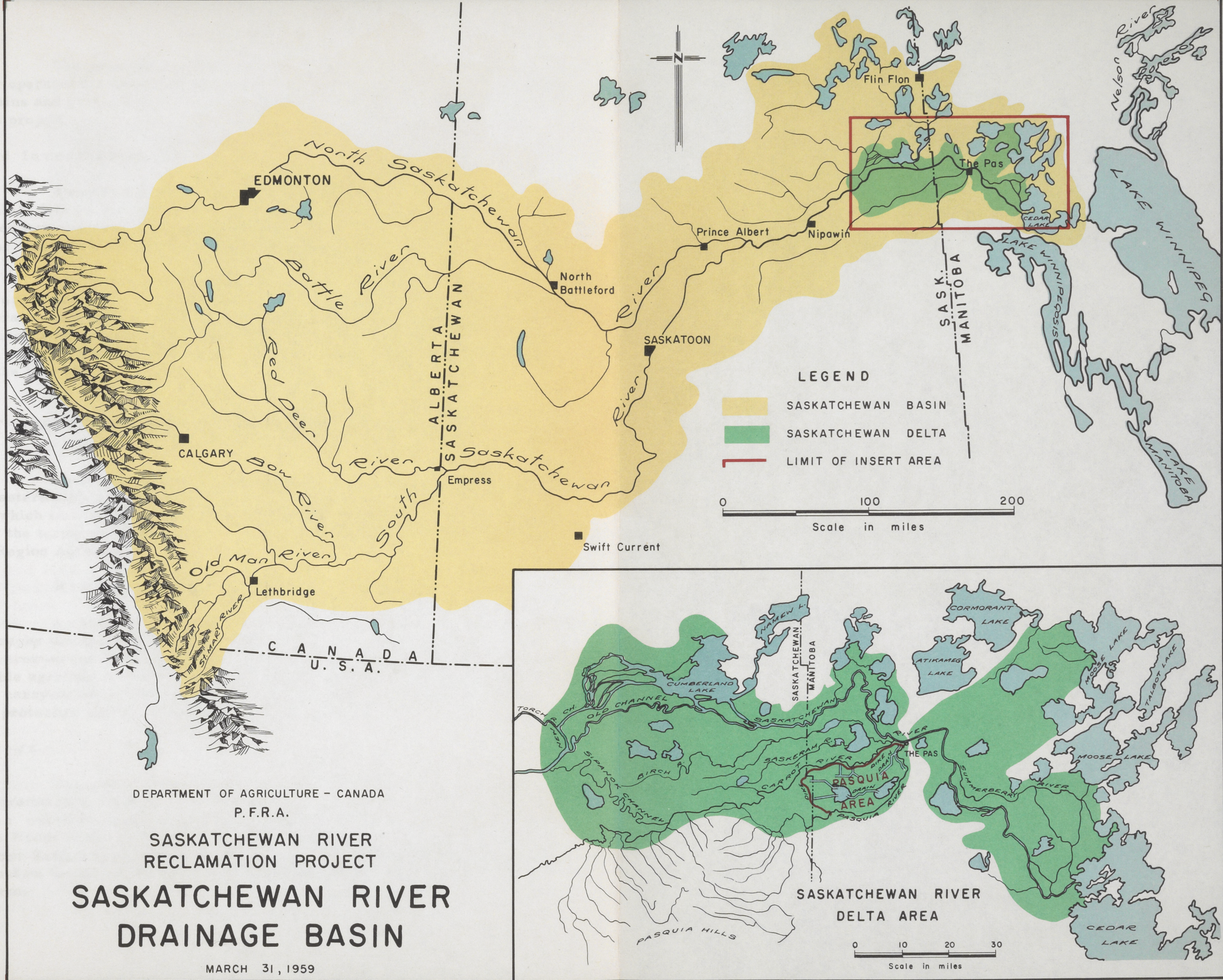
Completed Pumphouse No. 2 located at the control dam on the Pasquia River southwest of the town of the Pas, Manitoba.

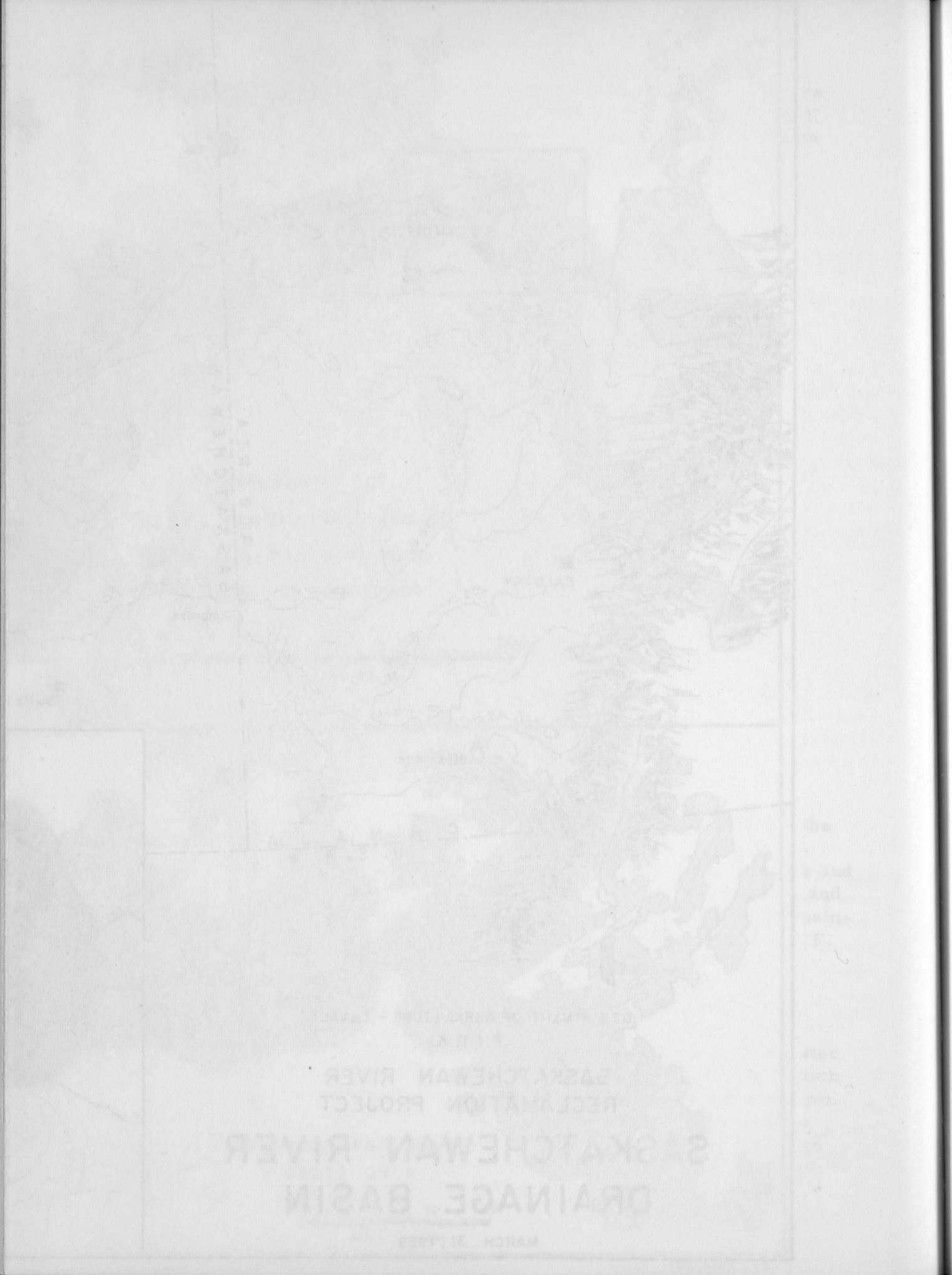
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Miscellaneous construction on the Pasquia Project included the completion of Drain H and I and the Pasquia Salt Lake drain, ditch dynamiting of 1,800 feet of pilot channel for Ditch F, installing several culverts and road approaches, preparing for seeding down of spoil banks and berms, and the installation of three drainage ditch control structures. All project maintenance and improvement work throughout 1958 was supervised by the P.F. R.A. office located at The Pas.

Operation

In operating the project approximately 50,000 acre feet of water were discharged through the Control Dam located on the Pasquia River which now serves as a main drain for the reclaimed areas. Control Structure No. 1 completed late in 1957 operated satisfactorily to prevent flooding of the Pasquia Lake area in the southeast section of the project. Three drainage ditches in the central part of the project were extended to permit a larger amount of water to enter Big Lake which is drained through the former Pasquia River.





SASKATCHEWAN RIVER
DRAINAGE BASIN

RECLAMATION PROJECT
SASKATCHEWAN RIVER

MARCH 31, 1953

The permanent pump at Mile 14 which discharges into the Carrot River operated for about 3 weeks in the spring, facilitating the construction of drains and preventing the flooding of cultivated land in the northwest part of the project.

Field Investigations

Twenty-one water level gauges established in the Pasquia Area to collect data on the behavior of lakes and stream elevations, indicated a marked improvement in the general water level of the reclaimed area. During the fall of 1958 six additional gauges were installed.

The meteorological station on Sec. 2-55-29/W1 in the Pasquia Area operated during the summer of 1958 recording rainfall, temperature, evaporation and wind velocity data. Rainfall from May 8 to October 31 was 9.55 inches as compared with the 46-year average of 11.8 inches for the same period. The frost-free period in 1958 was 102 days, eight days less than the long-term average.

NORTHWEST ESCARPMENT and INTERLAKE RECLAMATION PROJECTS

Land reclamation projects along streams flowing off the northern and eastern slopes of the Riding, Duck and Porcupine Mountains, and in the area which lies between Lake Winnipeg and Lake Manitoba, are authorized under the terms of the Federal-Provincial Northwest Escarpment and Interlake Region Agreement.

Riding, Duck and Porcupine Mountains

A combination of soil and vegetation problems coupled with steep topography through much of the Northwest Escarpment area creates a serious erosion and flood problem in an area containing over 252,000 acres of valuable agricultural land. To minimize the damage to farm lands, P.F.R.A. is carrying out a program of investigation and construction to provide flood protection and to reduce erosion problems.

Surveys

The establishing of vertical and horizontal ground controls for a photogrammetric study of 14 proposed damsites and reservoirs on the Woody River watershed concluded a study started in 1957. These field surveys on the Woody River were concentrated in the headwaters area near the Manitoba-Saskatchewan boundary. Surveys and investigations were also carried out on the lower Woody River in Manitoba, where flooding is a serious problem.



Looking east over the Riding Mountain escarpment area showing the eroded shale mountain slope in the foreground.

Ref. No. 18303-2

To permit a detailed evaluation of hitherto unassessed factors such as topography, soils, vegetative cover, precipitation, and runoff, an experimental watershed was chosen in the headwaters of Wilson Creek. The setting up of the test area involved surveys to establish the location of access roads, rainfall measuring apparatus, and controlled stream metering stations. Detailed topographical surveys of stream profiles and possible headwater storage reservoirs were also undertaken.

Construction

Most of the construction for 1958 was carried out in the Wilson Creek watershed. In addition, minor repairs were made to existing projects and some bank protection work started previously was completed during the year.

In the Wilson Creek control area the work consisted of construction of an access road, clearing secondary trails, and the installing and servicing of rain gauges and metering sites. In conjunction with the control area, precipitation and water level stage recorders were placed elsewhere in the Northwest Escarpment area.



Access road on the Wilson Creek Project showing the type of vegetation in the surrounding area.

Ref. No. 16864

Work in the Duck Mountain section consisted of the construction of one mile of road through the forest from Beaver Lake road into the Pine River headwater area. The Steep Rock Lake Dam and one and one-half miles of access road were built in the Porcupine Mountain Forest Reserve during 1958. This work was carried out by Provincial forces working under the Agreement.

Minor clean-up and improvement work was carried out in the Mineral Creek project completing the flood control scheme begun in 1957. Experimental stream bank erosion control work undertaken a year ago on Edwards Creek was concluded this year. A limited amount of grass reseeding was done in the Wilson River area.

Interlake Reclamation Area

Hay and grain production in the Interlake area between Lake Winnipeg and Lake Manitoba has been seriously curtailed as a result of damaging runoff floods along the rivers and streams that drain into major lakes. The activities of P.F.R.A. have been designed to alleviate these conditions

in three of the most seriously affected areas; the Swan Creek-Burnt Lake watershed, the Icelandic River system, and the Fish and Dennis Lake Basins.

Surveys

Detail surveys were carried out along the Icelandic River and on the land immediately adjacent to it. A report on possible methods of flood control in this area will be completed in May 1959. Surveys to devise a scheme for regulation of runoff from Fish Lake and Dennis Lake required 360 miles of levels and entailed hand clearing of 80 miles of line through scrub and brush. In the Swan Creek-Burnt Lake area, surveys were completed which established the required lines and grades for the letting of a 30-mile drainage improvement contract from Lake Manitoba to Burnt Lake.

Construction

Work started on the Burnt Lake Drain in October 1958. Cold weather and deep snow caused operations to stop in mid-November with approximately twelve miles of the drain being completed.

ASSINIBOINE RIVER PROJECT

The responsibility for flood control along the Assiniboine River was transferred in 1950 from the Federal Department of Public Works to the Department of Agriculture. Since that time P.F.R.A., in co-operation with the Province of Manitoba, has carried out a flood control program to protect the farm lands in the Lower Assiniboine River area which extends approximately 125 miles east from Brandon to Headingly, Manitoba. Most of the flood-protection work is located east of Portage la Prairie where dykes and river cutoffs have been constructed and maintained to prevent flooding of farm lands and to improve streamflow conditions in the river.

Upper Assiniboine River

Surveys

In recent years, to investigate other measures of flood control and water conservation, surveys have been conducted to determine the effect that storage in the Upper Assiniboine Basin would have downstream. During 1958 detailed studies were made of the features of 20 proposed headwater control reservoirs. The effect that various combinations of these reservoirs would have on downstream floods and low water control was presented.

In 1958 dams site surveys were completed on the Shell River and Silver Creek, tributaries of Upper Assiniboine River. In addition, a com-

prehensive agricultural survey was conducted on the Assiniboine River between Kamsack, Saskatchewan and St. Lazare, Manitoba, to determine the amount of agricultural land subject to flooding in that area.

Lower Assiniboine River

Surveys

Surveys were undertaken during 1958 to study the feasibility of establishing a large reservoir between Portage la Prairie and Brandon. Such a reservoir would provide flood control, streamflow regulation, and a water supply for a large area of southern Manitoba. Possible damsites were selected using photogrammetric methods, and ground controls were established by survey crews.

Construction

A total of two and one half miles of dykes was constructed along the Assiniboine River near High Bluff, Manitoba. The property needed to close the last gap in the dykes within the R. M. of Portage la Prairie has been acquired and brush clearing was completed this winter in preparation for construction of the final closure in this area.

Early in 1958 the Mill Creek floodway was repaired and enlarged and eighteen miles of dykes and borrow areas in the High Bluff region were seeded to grass.



Seeding dykes along the Assiniboine River near Portage la Prairie, Manitoba.

RIVERS WATER STORAGE PROJECT

A request for the construction of a general-purpose dam on the Minnedosa River, adjacent to the Town of Rivers, was received in 1956 from the Manitoba Government. Authority to construct this project was granted the following year and the contract for construction was awarded early in 1958. The total estimated cost of the project, which is expected to require about two years to construct, is over one million dollars. Work began on the dam and its appurtenant structures in mid-June 1958 and by the end of the construction season, this project was about 40 percent complete.

The dam, which will be 4,100 feet long and 75 feet high, will create a reservoir which, when full, will impound 25,000 acre feet of water. Located on a main tributary of the Assiniboine River this project will provide a reliable supply of water for livestock throughout the areas associated with the project and will be of sufficient size to make water available for domestic use in the surrounding rural and urban communities. The Rivers project will also assist in maintaining the streamflow in both the Minnedosa and Assiniboine Rivers during dry periods when normal streamflow might cease or be insufficient to provide for proper sanitation and riparian requirements.



Conduit outlet structure for reservoir created by the dam constructed on the Minnedosa River near the town of Rivers, Manitoba.

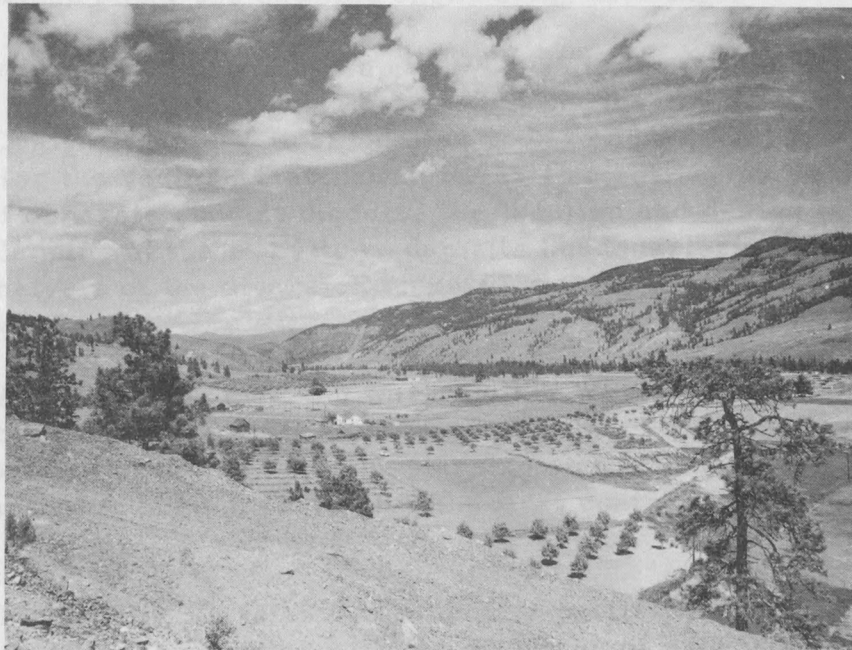
In addition to the main contract, two other jobs connected with the project were undertaken and completed in 1958. The brush was cleared from around the margin of the reservoir and a one-mile road diversion was constructed. In December a contract was let for the construction of a timber and steel bridge to replace a bridge that will be flooded out when the reservoir is full. Work began on this structure in January 1959 and by March 31 was 80 % complete.

BRITISH COLUMBIA PROJECTS

The activities of the Prairie Farm Rehabilitation Administration in the Province of British Columbia during 1958-59 were confined to the planning and commencement of construction of one major irrigation project, improvement of one existing project, and reconnaissance investigations of the possible extension of a Veterans' Land Act project to include additional lands.

During 1958 an agreement was reached between the B.C. Fruitlands Irrigation District, the Province of British Columbia, and the Federal Government for the rehabilitation of the district on a cost sharing basis. The planning and supervision of construction is being carried out by P.F.R.A.

The B.C. Fruitlands Irrigation District is an old established irrigation district initially consisting of some 2,900 acres north and west of the Village of North Kamloops. Irrigation water for this project was supplied by gravity from Jamieson Creek with supplementary water pumped from the North Thompson River. Having been in operation for over 40 years, this system had deteriorated to the point where the district could no longer guarantee the delivery of water to many of its users.



General view of Block C of the B.C. Fruitlands Irrigation District at North Kamloops, B.C.

Ref. No. 18235

Planning for the renovation of this project was carried out during the summer months of 1958 and construction by contract began in November 1958 with completion date set for May 1, 1959. The construction work involves minor repairs to the upper end of the canal, ditch, and flume system to service some 500 acres, and the installation of two separate pumping plants to supply irrigation and domestic water through a closed pipe system to 1,500 acres of agricultural land and some 700 small holdings of one-half acre or less.

The Penticton West Bench Project completed in 1954, experienced further trouble in 1958 with their automatic pump controls. This was corrected early in 1959 by P.F.R.A. engineers with the installation of more sensitive controls. To relieve water hammer which developed in a new section of the system, a four-inch swing check valve was installed in one of the main laterals. These alterations made up the project improvement work by P.F.R.A. in 1958-59.

During the year a preliminary reconnaissance investigation was carried out by P.F.R.A. for the Lakeview Irrigation District on the Veterans' Land Act Westbank project situated on the benchland across the Okanagan Lake from Kelowna, B.C. The economic possibilities of including some 1,000 acres of private land in the Lakeview Irrigation District was investigated with special regard to a delineation of land suitable for agriculture or subdivision, the available storage on upstream reservoirs, and the cost of irrigation of these lands through a pressure distribution system. This report was completed and turned over to the Lakeview Irrigation District in April 1959.

ENGINEERING SERVICES

A number of Divisions, under the general heading of Engineering Services, have been set up to supply basic information required by P.F.R.A. This information, which is usually not available from other sources, is generally of a technical nature requiring highly specialized knowledge, training, and equipment.

DESIGN DIVISION

The Design Division is responsible for the major engineering, planning and design work for all P.F.R.A. divisions and services. Certain engineering components of projects are done by other divisions giving engineering services, and this information is used by the Design Division in its own work, or integrated as supplied, into the completed design.

The engineering success of water-carrying structures is dependent to a great extent upon information gathered in regard to the hydraulic behaviour of structures obtained from scale-model testing under actual flow conditions. For this purpose, the Design Division operates a modest but well-equipped hydraulic laboratory in Regina.

During 1958-59 the Division designed the necessary structures for ten major projects, eight of which reached construction stage. A substantial amount of design work of a preliminary and investigational nature was done for other offices and divisions. The drafting department during 1958-59 produced about 650 detailed engineering drawings.

A new section was set up in 1958-59 to handle the design work on the South Saskatchewan River Project, but because of the experienced staff in the Design Division, it was called upon to do a large part of the design engineering for the South Saskatchewan River Project. This work included the testing of concrete conduit models, the location and design of two access roads, the planning of the P.F.R.A. damsite headquarters, the design and structural analysis of the diversion tunnels, and the design of the construction bridge piers.

All design engineering work for the Western Block of the Bow River Project north of the main canal was completed in 1958-59, as was the investigational work and preliminary planning on the Sundial and Retlaw Tracts. Plans have been prepared for the first contract on the Sundial lateral.

The Design Division was an active participant in the Co-ordinating and Engineering Committee with the Province of Alberta. All design and investigational work requested by that Committee was carried out during the

year.

Design work was also undertaken for special features of eleven other projects which included headwater controls in Upper Assiniboine River; building and livestock handling units for the Community Pasture Branch, and the engineering, planning and design of irrigation and control structures for the Eastern Irrigation District.

In the Hydraulics Laboratory experimental work was continued on the tunnel outlet works for the South Saskatchewan River Project. In addition, a general hydraulic investigation was made on the diverging type outlet structures.



A model test being run in the P.F.R.A. Hydraulic Laboratory in Regina on a diversion tunnel stilling basin for the South Saskatchewan River Project.

Ref. No. 17806-12

SOIL MECHANICS AND MATERIALS DIVISION

The Soil Mechanics and Materials Division is responsible for providing technical advice on the design and maintenance of earth dams, the foundation design of structures, and the use of soils, concrete and other materials for construction purposes. To carry on these functions the Division makes detailed investigations of damsites and foundations, conducts exhaustive laboratory tests, analyzes data, and makes appropriate design studies.

For those projects under construction, control testing of soils, cement and concrete is required, and special test apparatus must often be installed to measure the performance of dams, spillways and conduits. Performance records are kept and special studies are made to provide a guide for the improvement of design and construction procedures.

During 1958-59 preliminary Soil Mechanics Reports were prepared on eleven projects under investigation and twelve special reports on various phases of research and development work. In addition, other special studies were undertaken by the Soil Mechanics Division in 1958-59.

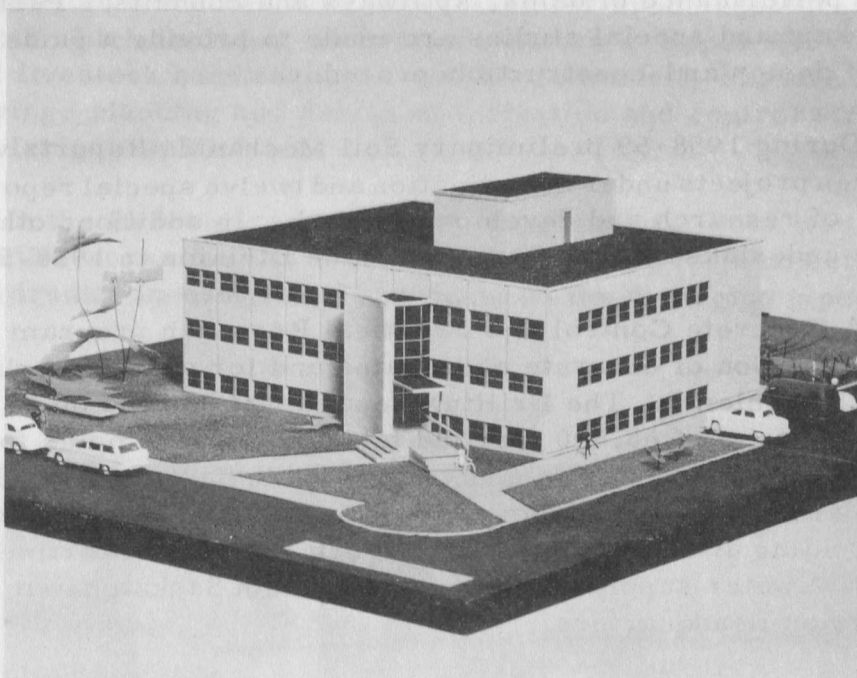
A Concrete Control and Practical Research program was carried out for the evaluation of concrete aggregates and for special studies on practical research problems. The Drilling Department worked on 29 different sites, drilling a total of 66,420 feet and taking 20,115 samples for analysis. The major part of this work was done on the South Saskatchewan River Project. The total footage includes over 10,500 acre feet of holes drilled for foundation grouting at the St. Mary Dam. The Drilling Department also explored potential water supply sources for the South Saskatchewan River Project Construction Headquarters.

The Frost Research program was expanded during the year with studies being conducted at 11 sites to determine the depth of frost penetration, the amount of heave due to frost action and the fluctuations in groundwater levels. Laboratory tests were conducted to measure capillarity and grain size of potential frost heaving soils. Research was also continued on highly plastic clay shales and canal linings.

During the year the Soil Mechanics Division prepared specifications for the Concrete Aggregate Processing Contract and prepared design layout plans for Stage 1 and 2 Embankment Contracts for the South Saskatchewan River Project. The Division reviewed the soil mechanics features of other plans and specifications and provided concrete and earthwork inspection services on contracts let during the winter of 1958-59.

A permanent Soil Mechanics and Materials Building was planned to provide space for the Division. Architectural studies of layout and function were made with the architects who prepared the necessary plans and specifications for the building. Tenders were called in October 1958. The main basement excavation was made and pile foundation installed under the supervision of the Division staff. Construction of the building proper was begun in January 1959 and is expected to be completed in late 1959.

Members of the Division assisted in the program and work associated with the Twelfth Annual Soil Mechanics Conference held in Saskatoon December 8 and 9, 1958. Members of the Division presented two papers to this meeting, one entitled "Test Apparatus in Earth Embankments" and the other "The Proposed South Saskatchewan River Dam". A paper entitled



Model of P.F.R.A. Soil Mechanics Laboratory being constructed on the University of Saskatchewan grounds at Saskatoon.

Ref. No. 16327-2

"Evaluation and selection of Aggregates for Concrete Construction" was prepared and presented at the Annual Convention of the Canadian Good Roads Association, and a paper entitled "Rebound in the Bearpaw Shale, Western Canada" was published by the Geological Society of America.

The Soil Mechanics staff provided technical assistance for the Consulting Board appointed by the Canadian Army to investigate the failure of the Peace River Bridge.

AIR PHOTO ANALYSIS AND ENGINEERING GEOLOGY DIVISION

The services of the Air Photo Analysis and Engineering Geology Division consist of providing qualitative and quantitative data from air photos and supplying geologic information to assist in the investigation and design of P.F.R.A. projects. To carry out this work requires a detailed interpretation and analysis of air photos, the compilation of plans by photogrammetric techniques, the maintenance of an air photo library and the preparation of mosaics from air photos. Information relating to the origin and history of valleys, and the engineering properties, origin, and mode of deposition of

geologic materials, is supplied by this Division,

During 1958-59, air photo reconnaissance studies were made on Turtlehead Creek, Wascana Creek, Souris River, Kamsack Creek and Cus-sed Creek to determine possible damsites. Air photo studies along with followup field checks were made on the Turtle Mountain Pasture, Cote-San Clara Pasture and the McCreary Pasture. A report entitled "Big Boggy Creek Accuracy Test" was prepared describing the accuracy of the Balplex photogrammetric plotter using new distortion-free aerial photography. A total of 28 photogrammetric plans were completed showing topography of proposed reservoir areas of selected sites in Manitoba, Saskatchewan and Alberta.

Contracts were let during the year for air photo coverage of the Lower Assiniboine River downstream of Brandon, Manitoba; the Gap Dam-site area on the Old Man River in Alberta, and the reservoir area of the South Saskatchewan River Project. New 1958 photography for the Neepawa Area of Manitoba was obtained through agreement with the Interdepartmental Committee on Air Surveys. One inch to one mile coverage of the delta area of the Saskatchewan River east of The Pas, Manitoba, was purchased from the National Air Photo library and 1958 coverage of the Buffalo Pound Lake was purchased from an air survey company.

In addition to regular township-type mosaics prepared during the year, a mosaic of the entire South Saskatchewan Reservoir area was completed as well as four mosaics covering a portion of the Saskatchewan River Delta area east of The Pas, Manitoba. To assist the new soil survey of Saskatchewan, the Division prepared 509 regular township mosaics in 1958-59.

A new technique is under development by this Division of P. F. R. A. whereby the analysis and interpretation of vegetation, soils, surface geology, land use and drainage are done by photogrammetric means. Working from a stereomodel, it is possible to measure accurately such things as the height of trees, slopes, bank heights, and stream gradients to complement air photo patterns. As a result, a more comprehensive and complete plan is produced.

HYDROLOGY DIVISION

The Division was established for the purpose of providing basic hydrologic information for the planning, design and operation of P.F.R.A. projects. In addition, the Hydrology Division acts as the Secretariat for the Prairie Provinces Water Board for which it undertakes special studies. It also provides information for the Canadian section of certain International Engineering Boards established under the International Joint Commission.

The Work of the Hydrology Division falls into three categories;

water supply and water utilization studies for the individual projects, flood potential studies for individual projects, and comprehensive studies on a watershed basis.

Individual Project Studies

Small studies were made to evaluate the water supply or the flood potential or both for twenty-eight projects during the past year.

Office investigation of water supply includes a reconstruction of available hydrometric and meteorological information, an estimate of the water demands which will develop at the project, and a study of the storage requirements necessary to supply a certain demand in a certain area.

Flood potential investigations for small projects are usually restricted to estimates of flood peaks with recurrence intervals of fifty years or less. When hydrometric records are available, a flood frequency curve is prepared for the project in question. To assist in estimating flood potential for areas with no hydrometric data, a comprehensive study of flood frequencies on the prairies has been initiated. The final results of a flood potential study are usually presented in the form of a table indicating the odds in any one year that the flood potential will exceed a calculated flow.

Investigations which are now under way include water supply and flood potential studies for storage sites on Willow Creek in Alberta, reconstruction of levels at Wakaw Lake in Saskatchewan, and others.

Watershed Studies

During the past year four watershed-type studies were completed in addition to the completion of the series on the Qu'Appelle watershed. The study of water supply and flood potential for the Upper Assiniboine Basin has been completed and the results will appear as Appendix II of the final Assiniboine Report which is being prepared jointly by the Saskatchewan Regional Engineer and the Hydrology Division. The overall study of the Assiniboine Watershed was carried out by the Regional Offices in Saskatchewan and Manitoba assisted by the various divisions of the Engineering Services Branch.

Miscellaneous

Snow surveys were made in the Upper Qu'Appelle Basin to assist in predicting the runoff volume at Buffalo Pound Lake and also in the Lower Qu'Appelle Basin to provide an index of probable runoff in the area east of Craven. These surveys are carried out in close co-operation with the Manitoba Water Resources office who make a snow survey for the whole Assiniboine

Basin on February 15 and March 15 of each year. As in the past, assistance has been given the Experimental Farm Service in operating the run-off station at Davin. An analysis has been started of the hydrometric records available on the South Saskatchewan River to permit the development of an accurate tailwater rating curve at the Coteau Creek damsite. This analysis will also assist in short term flow prediction for the damsite area.

As Secretariat of the Prairie Provinces Water Board, the Hydrology Division is making a study of the frequency and amount of runoff at any point on the prairies. This will provide information for water studies comparable to the flood information which will be provided by the flood frequency studies.

DRAINAGE DIVISION

To investigate and find solutions to the drainage and alkali problems which arise under irrigation, P.F.R.A. organized a Drainage Division in 1949. This division works closely with other services in the location of canals, problems associated with canal seepage, and on the location and types of drains for specific soil types. The Drainage Division also carried out continuing water level and salinity investigations on P.F.R.A. irrigation projects in Alberta and Saskatchewan. This division has carried out extensive sampling and analysis of various soil series to evaluate their behavior under irrigation.



Aerial view of the Drainage Division Headquarters, Laboratory and test plots at Vauxhall, Alberta.

Bow River Irrigation Project

Groundwater Observations

Observation wells installed in the Drain 1 area at Vauxhall in 1957 indicated that due to improved surface drainage the water table was approximately the same or lower than in the previous year and that the tile drains are retaining the water table at a desirable depth in their area of influence. In the Hays area observation wells and piezometers show the groundwater level to be generally lower for the Distributary "U" area and slightly higher in the area adjacent to Lateral "R". With few exceptions, observation wells in the Hays District were dry to 25 feet. Investigations as to effectiveness of tile drains on the Bow River Project were continued with water sampling and discharge measurements being recorded regularly.

Surveys

Drainage engineering surveys were made to obtain elevations and location of observation wells and piezometers on groundwater studies. Location and construction surveys were completed for an experimental drainage plot at Vauxhall. Miscellaneous surveys included location and level surveys for deep piezometers, soil test holes and tile drain surveys.

Land levelling surveys were completed on 435 acres in the Vauxhall area with detailed levelling plans on 326 acres and check surveys during construction on 129 acres. Dykes and ditches were located on this land if requested. A land levelling, use and yield survey was conducted in August and December 1958.

Special Investigations

During the year studies were initiated to determine the response of glacial till soils to tile drainage, to observe the effects of shallow and deep tile drainage on salinity control and the prevention of waterlogging in the soil root zone, and to correlate and interpret field data with laboratory analyses as pertaining to leaching and soil amendments such as gypsum.

The greatest amount of salt was removed from the upper 3 feet of the soil profile above the tile drains with the initial application of 17 inches of water. A further application of 30 inches removed most of the remaining salt from the 3 - 6 foot of profile. The higher gypsum content of the soil was considered helpful in maintaining reasonably good permeability to water with leaching.

In 1958 a start was made in determining the magnitude and direction of soil moisture movement at different periods throughout the season. Periodic soil sampling was also carried out to follow the salt movement in

the soil. The effect of leaching, with or without gypsum, on the salt status of the soil was under field and laboratory study during the year.

Dugout investigations were continued in 1958-59 with 12 sites being located for farmers in the Vauxhall area, and 36 sites in the Hays area. The performance of both lined and unlined dugouts was followed throughout the year.

Special studies were conducted in problem areas on the Bow River Project. Detailed soil and drainage studies were conducted and recommendations made by the Drainage Division on these areas.

As measured in other years the salinity of the irrigation water increases from 180 p.p.m. at the Carseland Diversion, to about 400 p.p.m. in Travers Reservoir. There is no appreciable increase beyond this point.

MAPLE CREEK IRRIGATION PROJECT

Drainage wells drilled and developed prior to 1957 on the Upper and Lower V projects were operated continuously by project personnel from May 1 to October 1. Piezometers at various depths were used to measure their effectiveness in lowering the water table in the surrounding area. Generally the water table was lowered 2 to 9 feet during the pumping period. With a few exceptions, the water table rose during a two-month period after pumping, often as much as 10 feet but about 5 feet on the average. There was no appreciable change in the salt status of the groundwater pumped.

Detailed drilling and soil sampling was carried on in the Maple Creek "Flats" to compare adjacent virgin soil types with similar soils that have been under irrigation for a number of years. The survey indicated that the problem areas are a relatively small percentage of the total area and that they are located mainly on the fringes of the project.

LAND CLASSIFICATION STUDIES

Studies undertaken during 1957 indicated certain trends of salt movement in various soil series under irrigation as compared with the original dryland. Follow up investigations in 1958 were directed at extending the soil series coverage, and obtaining more detailed information regarding the solonetzic soil series. This information is regarded as essential for the developing of land classification standards.

The Drainage Division co-operated with other members of the Land Classification Committee in a study as to how soils and topography influence yields and net returns. Such studies have shown significant correlation of soils and topography with yields.

CONSTRUCTION, EQUIPMENT and SUPPLY DIVISION

The Construction, Equipment and Supply Division serves as a co-ordinating and servicing group for many of the operational activities of other branches of P.F.R.A. In this capacity the division employs technicians and tradesmen with a variety of abilities and skills. Equipment is provided to enable these men to undertake many types of work which cannot be conveniently undertaken by local contractors or business establishments, due to the inaccessibility of the area or the character of the work. Materials are procured for many activities and may be processed to finished products or adapted to particular uses as required.

The administration of this Division is centered in Regina headquarters with service units located in Moose Jaw, Vauxhall, Lethbridge and Regina. These units repair and maintain P.F.R.A. equipment and machinery, design and construct new and special types of equipment required by the various branches of P.F.R.A. and serve as storage and distribution centers for the organization.

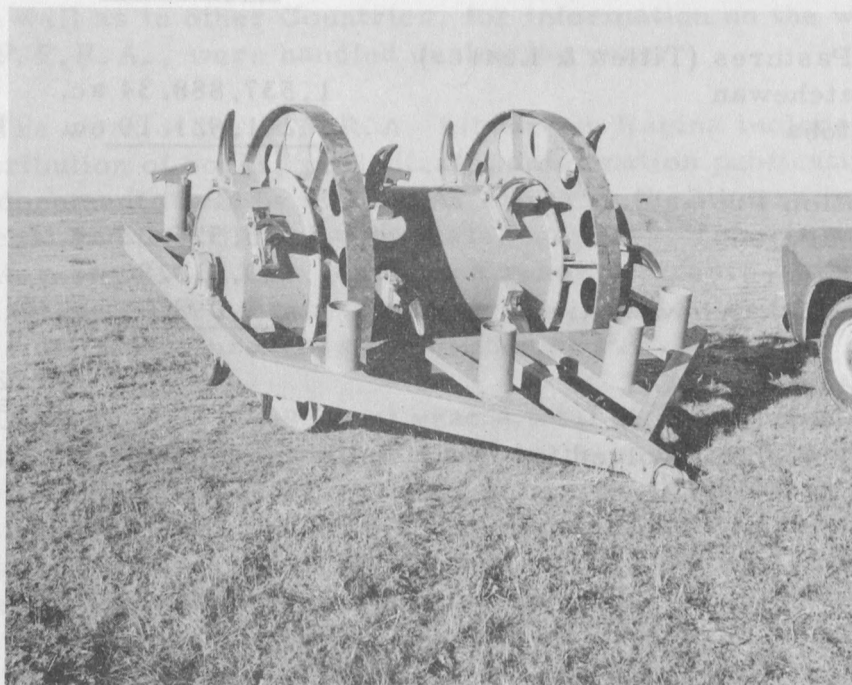
During 1958 there were 116 field jobs of various sizes undertaken by P.F.R.A. maintenance crews and equipment. These jobs included steel and timber pile driving on several water storage projects, building the irrigation ditches and installing all the timber structures and extensions to the Eastend and Nashlyn irrigation projects; fireguarding in community pastures, repairing or rebuilding concrete spillways and structures; and land levelling and water development projects in community pastures. Several other jobs were done with local machinery and labour and was supervised by members of the maintenance staff. Many other maintenance duties on irrigation projects and community pastures were carried out by operational personnel with the help of equipment provided by the Division. This service made it possible for routine repair work to be done efficiently. Cost records are maintained which provide a gauge for comparison with contract work.

The trade shops overhauled and repaired vehicles, tractors and maintenance equipment. Two special type machines were designed and constructed in 1958; a four-foot diameter steel ball for use in bush clearing operations in the parkland pastures, and a range pitting machine for use in water conservation programs in community pastures. To test models of conduits proposed for the South Saskatchewan River Project, an apparatus was built to apply vertical and horizontal loads simultaneously to the various designs of conduit models.



Four foot ball and chain coupling device constructed by the Moose Jaw service unit. Steel ball weighs four tons.

Ref. No. 16899



Tooth pitter constructed at the Moose Jaw warehouse for deep pitting shown in transport. Wheels are removed when in operation.

Ref. No. 17001

LAND INVESTIGATION and APPRAISAL DIVISION

The Land Investigation and Appraisal Division of P.F.R.A. is responsible for the acquisition of all land required by P.F.R.A. in carrying out its land and water conservation and reclamation program. The work of the Division involves the investigation, leasing and purchase of lands required for the various projects, road diversions and canals. Land exchanges and recommendations for payment of claims resulting from construction are also handled by this Division. When land is required the procedure followed is to obtain "Right of Entry" or an "Option for Land Purchase" in order that investigations and construction may be undertaken. Land appraisal for negotiation purposes is carried out on all lands required by P.F.R.A. Submissions for authorization to purchase, are based on the appraisal report.

The Land Investigation and Appraisal Division also maintains a record of Registered Survey Plans, Community Pasture Plats, and Titles, Leases and Permits for Land held by P.F.R.A. on behalf of Canada.

As of March 31, 1959, this Division was responsible for the following acreages:-

Water Conservation & Reclamation Projects -

Saskatchewan and Alberta	77,293.73 ac.	
Manitoba	<u>2,247.26 ac.</u>	79,540.99

Community Pastures (Titles & Leases)

Saskatchewan	1,537,888.34 ac.	
Manitoba	<u>241,921.19 ac.</u>	1,779,809.53

Major Irrigation Projects

St. Mary	10,535.02 ac.	
Bow River	129,510.80 ac.	
South Saskatchewan River	<u>3,098.45 ac.</u>	<u>143,144.27</u>

TOTAL ACREAGE		<u><u>2,002,494.79</u></u>
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The cost involved for land acquisition during the fiscal year 1958-59 amounted to \$462,591.62.

PLANNING and INFORMATION DIVISION

The Planning and Information Division was established in 1949 to provide information, library and photographic services to all branches and divisions of P.F.R.A. The principal duty of the Planning and Information Division is to collect and assemble factual information pertaining to the history and development of P.F.R.A. projects for use in the preparation of reports and publications. This Division prepares the P.F.R.A. Annual Report; the reports on P.F.R.A. activities used in the Annual Report of the Minister of Agriculture and the Canada Year Book; monthly reports of activities for the Deputy Minister of Agriculture, and progress and summary reports on current P.F.R.A. projects. It is also involved in preparing and editing material on P.F.R.A. activities used in articles appearing in technical journals, magazines and newspapers; filling requests for information on P.F.R.A. activities from schools, government and private agencies, and research institutions; and carrying out special research assignments as required by the Director or other divisions of P.F.R.A.

A further activity of the section is to be responsible for arranging the program and itinerary of visitors to P.F.R.A. from other parts of Canada and from other countries. During the year a number of visitors were given an opportunity to become familiar with the various phases of rehabilitation and reclamation work carried out by P.F.R.A. In addition to the routine duties, numerous requests from individuals living in all parts of Canada as well as in other Countries, for information on the work and program of P.F.R.A., were handled during the year.

The work of the P.F.R.A. Library in Regina includes the ordering and distribution of books, periodicals, information publications and government documents held by P.F.R.A. either in the library in Regina or in other offices; and the filing of pamphlets, bulletins, reports and books of particular interest in P.F.R.A. work as a ready reference for all members of the organization. The Library also provides an inter-library loaning service to the divisions, branches and offices of P.F.R.A.

During the 1958-59 fiscal year a total of 750 publications were processed through the library, 507 of which were purchased, 183 were obtained free of charge, and 60 were received on loan from other libraries. Approximately 145 periodicals were circulated regularly by the library to interested staff members both in Regina and in field offices. In addition the library looked after the filing and cataloguing of reports and proceedings prepared by the various departments of the organization and retained in the library for reference purposes.

The Photo Section provides photographic services to all divisions

and branches of P.F.R.A. and also to other Federal Government Departments in Regina and Indian Head. It also assumes responsibility for the care of P.F.R.A. photographic equipment, and maintains a complete file of pertinent P.F.R.A. black and white prints, negatives, and color slides.

The quantity of work and the number of services requested in the Photographic Section continued to increase during the past year. Twelve hundred and eleven requests were received for various types of work, resulting in the developing of 409 rolls of film, the printing of 6,109 contact pictures and 30,675 enlargements varying in size from 4" x 5" to 16" x 21" and the copying of 3,193 mosaics, plans and charts. About 2,500 prints and color slides were added to both the print and slide file respectively. The integration of the Manitoba regional office photo files with the Regina headquarter's file was completed during 1958-59.

Following the signing of the Agreement to construct the South Saskatchewan River Project, a large number of requests were filled for publicity prints showing progress of construction on the project. The number of requests for sets of color slides to be used in illustrated talks to agricultural groups increased significantly. During 1958-59, considerable time was spent assembling and organizing 16 mm movie material taken previously. Some additional footage was shot in connection with irrigation and community pasture work. A film on Pasture Improvement operations was completed and a progress film is being taken of construction on the South Saskatchewan River Project.

APPENDIX I

WATER DEVELOPMENT PROGRAM

Number of projects and amount of financial assistance paid from 1935 to March 31, 1959

	DUGOUTS				STOCKWATERING DAMS				IRRIGATION SCHEMES				TOTALS	
	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid		
MANITOBA														
Individual	11,434	1,146,977.09	314	23,459.38	167	49,351.34	11,915	1,219,787.81						
Neighbour	56	11,147.84	14	3,683.49	8	2,212.62	78	17,043.95						
Community	6	11,030.86	23	128,169.72	2	30,582.54	31	169,783.12						
Total	11,496	1,169,155.79	351	155,312.59	177	82,146.50	12,024	1,406,614.88						
SASKATCHEWAN														
Individual	31,515	3,521,934.75	4,359	375,927.25	2,199	501,115.78	38,073	4,398,977.78						
Neighbour	278	70,240.32	54	11,690.94	94	39,113.40	426	121,044.66						
Community	282	217,082.34	174	933,683.84	64	619,284.54	520	1,770,050.72						
Total	32,075	3,809,257.41	4,587	1,321,302.03	2,357	1,159,513.72	39,019	6,290,073.16						
ALBERTA														
Individual	5,563	578,728.46	2,289	218,121.08	1,037	246,085.96	8,889	1,042,935.50						
Neighbour	37	10,800.88	13	3,318.10	13	4,231.85	63	18,350.83						
Community	33	41,958.86	104	677,085.82	52	657,824.23	189	1,376,868.91						
Total	5,633	631,488.20	2,406	898,525.00	1,102	908,142.04	9,141	2,438,155.24						
GRAND TOTAL	49,204	5,609,901.40	7,344	2,375,139.62	3,636	2,149,802.26	60,184	10,134,843.28						

APPENDIX II

WATER DEVELOPMENT PROGRAM

Progress by Years in the Construction of Individual, Neighbor and Community Projects

Fiscal Yr.	Number of Projects Constructed				Financial Assistance Paid			
	DO	SWD	IRR	TOTAL	DO	SWD	IRR	TOTAL
*1935-45	18,842	4,312	1,004	24,158	1,979,324.48	468,958.53	168,871.84	2,617,154.85
1945-46	4,316	261	28	4,605	489,782.13	27,752.56	4,685.28	522,219.97
1946-47	4,945	199	48	5,192	581,172.05	48,341.75	8,697.82	638,211.62
1947-48	1,804	241	64	2,109	202,443.78	140,601.81	90,715.57	433,761.16
1948-49	1,508	220	77	1,805	171,566.42	319,540.09	365,241.68	856,348.19
1949-50	3,031	164	123	3,318	367,392.80	214,973.66	220,242.50	802,608.96
1950-51	3,442	494	721	4,657	408,385.52	295,594.47	237,892.22	941,872.21
1951-52	478	106	350	934	60,051.14	95,488.30	171,773.19	327,312.63
1952-53	861	119	290	1,270	100,219.54	32,769.41	116,672.07	249,661.02
1953-54	1,791	190	187	2,168	227,372.12	126,415.05	209,287.59	563,074.76
1954-55	1,314	242	193	1,749	161,716.42	201,457.82	122,534.03	485,708.27
1955-56	504	159	114	777	68,141.55	78,443.87	87,547.88	234,133.30
1956-57	863	131	114	1,108	112,268.86	46,272.04	157,803.10	316,344.00
1957-58	2,218	225	155	2,598	268,273.35	143,319.23	90,787.91	502,380.49
1958-59	3,287	281	168	3,736	411,791.24	135,211.03	97,049.58	644,051.85
TOTAL	49,204	7,344	3,636	60,184	5,609,901.40	2,375,139.62	2,149,802.26	10,134,843.28

DO - Dugout

SWD - Stock Watering Dam

IRR - Individual Irrigation Project

* - Annual figures for accumulated years may be found in previous reports

APPENDIX III COMMUNITY WATER DEVELOPMENT PROJECTS Constructed in 1958

Name of Project	Location	Prov.	Type of Project	Irr. Ac.	Acre Feet	Costs
Abbey	Abbey	Sask.	Stockwatering Dugout	-	1.5	\$ 1,000.00
Airdrie	Calgary	Alta.	Multi-purpose Res.	-	200	9,789.37
Alsask	Alsask	Sask.	Multi-purpose Res.	-	30	9,709.95
Amsterdam	Amsterdam	Sask.	Stockwatering Dugout	-	1.5	955.55
Avlon	Biggar	Sask.	Stockwatering Dugout	-	3	839.50
Bengough	Bengough	Sask.	Stockwatering Dugout	-	1	927.00
Bircham	Calgary	Alta.	Flood Irrigation	1,200	-	8,294.55
Bow Island	Bow Island	Alta.	Stockwatering Dugout	-	1.5	1,000.00
Bratt's Lake	Wilcox	Sask.	Stockwatering Dugout	-	1.5	733.53
Bryn Mawr.	Earl Grey	Sask.	Stockwatering Dugout	-	1.5	997.12
B.T. Grazing Co-op	Hilda	Alta.	Stockwatering Dugout	-	3	1,000.00
Buffalo Valley	Wiseton	Sask.	Stockwatering Dugout	-	1.5	598.00
Chaplin	Chaplin	Sask.	Stockwatering Dugout	-	3	886.08
Claydon	Claydon	Sask.	Irrigation	700	300	3,240.00
Coleville	Coleville	Sask.	Stockwatering Dugout	-	1.5	999.50
Colgate	Colgate	Sask.	Flood Irrigation	320	-	7,110.23
Congress-Stonehenge	Limerick	Sask.	Stockwatering Dugout	-	2	1,000.00
Craigmyle	Craigmyle	Alta.	Multi-purpose Dugout	-	1.5	1,000.00
Crestwynd	Crestwynd	Sask.	Stockwatering Dugout	-	1.5	980.33
Crowfoot	Gleichen	Alta.	Multi-purpose Res.	-	110	3,576.12
Cypress View	Irvine	Alta.	Multi-purpose Res.	-	300	11,336.21
Demaine	Demaine	Sask.	Multi-purpose Dugout	-	1.5	805.00
Dixon Lake	Spring Valley	Sask.	Flood Irrigation	2,500	500	10,146.09
Doddsland	Druid	Sask.	Stockwatering Dugout	-	1.5	999.50
Downey Lake	Maple Creek	Sask.	Stockwatering Dam	-	58	1,404.00

Name of Project	Location	Prov.	Type of Project	Irr. Ac.	Acre Feet	Costs
Dry Coulee	Eastend	Sask.	Stockwatering Dam	-	10	\$ 1,605.30
East Borden Grazing Co-op	Borden	Sask.	Stockwatering	-	60	994.00
East Trout Creek	Stavely	Alta.	Stockwatering Dam	-	8	3,446.40
Ebenezer	Ebenezer	Sask.	Multi-purpose Dugout	-	2	735.76
Egg Lake	Avonhurst	Sask.	Multi-purpose Res.	800	-	5,834.60
Emerald Hill	Milestone	Sask.	Stockwatering	-	250	7,582.15
Excelsior	Rush Lake	Sask.	Stockwatering Dugout	-	1.5	998.24
Fillmore	Fillmore	Sask.	Stockwatering Dugout	-	1.5	1,000.00
Foam Lake (Elfros)	Foam Lake	Sask.	Flood Irrigation	4,000	-	11,964.48
*Freemont	Freemont	Sask.	Stockwatering Dugout	-	2	499.00
Garden Plains	Spondin	Alta.	Stockwatering Dugout	-	6	1,596.00
*Govan	Govan	Sask.	Multi-purpose Dugout	-	1.5	283.34
Granlea	Granlea	Alta.	Multi-purpose Res.	-	725	757.50
Heath Creek	North Fork	Alta.	Stockwatering Dam	-	12	3,848.40
Kyle-Lacadena	Lacadena	Sask.	Stockwatering Dugout	-	2	800.00
Lochend Lake	Calgary	Alta.	Dam & Irrigation	1,600	1,100	7,750.35
MacArthur	Walsh	Alta.	Multi-purpose Res.	-	700	14,105.76
Marienthal	Torquay	Sask.	Stockwatering Dugout	-	1.5	756.00
Michelle Coulee	Thelma	Alta.	Multi-purpose Res.	-	800	13,935.55
Neudorf	Neudorf	Sask.	Multi-purpose	-	-	1,789.76
New Brigden	Hanna	Alta.	Stockwatering Dam	-	60	3,581.53
Ogema	Ogema	Sask.	Stockwatering Dugout	-	1.5	863.36
Orkney	Orkney	Sask.	Stockwatering Dam	-	10	1,982.00
Osborne	Iddesleigh	Alta.	Stockwatering Dam	-	210	6,395.35

Name of Project	Location	Prov.	Type of Project	Irr. Ac.	Acre Feet	Costs
Perdue	Perdue	Sask.	Stockwatering Dugout	-	1.5	\$ 854.00
Rose Glen Water Users	Schuler	Alta.	Multi-purpose Dam	200	150	6,884.15
Saline	Invermay	Sask.	Multi-purpose Res.	1,000	-	2,376.60
Scotsguard	Shaunavon	Sask.	Stockwatering Dugout	-	3	1,857.00
Sintaluta	Sintaluta	Sask.	Stockwatering Dugout	-	1.5	997.50
Spruce Coulee	Elkwater	Alta.	Multi-purpose Res.	-	1,000	5,640.71
Spy Hill	Spy Hill	Sask.	Stockwatering Dugout	-	1.5	792.93
St. Jean Baptiste	St. Jean Baptiste	Man.	Multi-purpose Dugout	-	1.5	999.00
Tatagwa Lake	Weyburn	Sask.	Flood Irrigation	10,000	-	28,840.44
Tilney	Tilney	Sask.	Multi-purpose Res.	-	100	8,308.32
Two Lakes	Elkwater	Alta.	Multi-purpose Res.	1,500	1,900	14,378.12
Valley Centre	Bents	Sask.	Stockwatering Dugout	-	1.5	984.85
Verwood	Verwood	Sask.	Stockwatering Dam	-	16	1,414.00
Vonda	Vonda	Sask.	Multi-purpose Dugout	-	2	925.00
Wakaw	Wakaw	Sask.	Stockwatering Dugout	-	1.5	996.25
Weed Creek	Broadview	Sask.	Flood Irrigation	2,000	-	3,099.45
White Gull Lake	Gull Lake	Sask.	Flood Irrigation	263	-	1,743.00
Wilkie	Wilkie	Sask.	Stockwatering Dugout	-	1.5	999.50

* - Govan)
Freemont) Incomplete

APPENDIX IV
LARGE WATER DEVELOPMENT PROJECTS
Constructed 1935 to March 31, 1959

Name of Project	Location	Prov.	Type of Project	Completed	Irr. Ac.	Acre Ft.	Costs
Adair Creek Dam	Wolseley	Sask.	Multi-purpose	1956	40	350	\$ 59,849.00
Adam's Lake	Battle Creek	Sask.	Irrigation	1936	1,500	2,000	8,831.00
Aetna Irrigation District	Aetna	Alta.	Irrigation	1947	8,000	-	82,004.00
Atlee Gas Well No. 1	Atlee	Alta.	Irrigation (pump)	1939	7,000	-	12,423.00
Atlee Gas Well No. 2	Atlee	Alta.	Irrigation (pump)	1939	-	-	14,300.00
Bartman Dam	Cessford	Alta.	Irr. & Stockwatering	1943	1,000	3,000	49,100.00
Battleford	North Battleford	Sask.	Irrigation (pump)	1941	800	-	3,058.00
Bedford Slough	Medicine Hat	Alta.	Irrigation	Incomplete	3,000	200	35,493.00
Big Arm Storage	Liberty	Sask.	Irr. & Stockwatering	1939	5,000	5,200	13,161.00
Boissevain	Boissevain	Man.	Storage	1954	-	580	29,992.00
Brown Hill Dam	Grenfell	Sask.	Multi-purpose Res.	1958	-	275	99,394.00
Buffalo Pound	Qu'Appelle Valley	Sask.	Irr. & Stockwatering	1940	x	-	83,723.00
Bullshead Creek	Medicine Hat	Alta.	Irr. & Stockwatering	1940	800	1,130	8,170.00
Canada Land & Irrig. Co.	Medicine Hat	Alta.	Irrigation	1936	45,000	-	80,000.00
Canora	Canora	Sask.	Storage	1941	-	300	16,128.00
Caron	Caron	Sask.	Storage	1948	-	100	17,109.00
Caron Water Development	Thunder Creek	Sask.	Storage & Stockwatering	1944	-	43,500	710,433.00
Consul-Vidora Irrig.	Vidora	Sask.	Irrigation	1950	3,000	-	62,500.00
Craven Dam	Qu'Appelle Valley	Sask.	Irr. & Stockwatering	1943	x	-	33,675.00
Crooked & Round Lakes	Qu'Appelle Valley	Sask.	Irr. & Water Control	1941	x	-	48,650.00
Cypress Storage Reservoir	Ravenscrag	Sask.	Storage for Irrig.	1939	20,000	80,000	467,691.00
Davidson Dam	Davidson	Sask.	Irr. & Stockwatering	1937	100	277	3,114.00
Deadfish Creek	Cessford	Alta.	Irrigation	1949	4,000	5,000	47,832.00
Dead Lake	Macoun	Sask.	Irr. & Stockwatering	1941	-	-	17,528.00
Dunn & Watt	Mankota	Sask.	Irrigation	1937	305	-	2,996.00

Name of Project	Location	Prov.	Type of Project	Comp. leted	Irr. Ac.	Acre Ft.	Costs
Eastend	Eastend	Sask.	Irrigation	1939	4,000	1,300	\$ 161,682.00
Eastern Irrig. District	Brooks	Alta.	Irrigation	1937	2,280	22,000	22,490.00
Echo Lake	Qu'Appelle Valley	Sask.	Irrigation	1943	x	—	41,753.00
Eureka Irrig. District	Grassy Lake	Alta.	Irrigation	1949	12,000	1,000	38,568.00
Fairy Hill	Qu'Appelle Valley	Sask.	Irr. & Water Control	1941	x	—	4,302.00
Graham Creek	Calgary	Alta.	Stockwatering	1943	—	230	8,529.00
Gouverneur Dam	Ponteix	Sask.	Irrigation	1952	6,000	10,000	242,468.00
Hugonard Dam	Lebret	Sask.	Multi-purpose Res.	1956	100	400	64,231.00
Kaposvar Creek	Melville	Sask.	Stockwatering	1954	—	1,400	102,747.00
Katepwa Weir	Qu'Appelle Valley	Sask.	Irr. & Water Control	1957	—	—	61,192.00
Killarney Dam	Killarney	Man.	Multi-purpose Res.	1956	—	800	41,965.00
Kisbey Flats	Kisbey	Sask.	Irrigation	1939	2,300	5,000	23,211.00
Lafleche Dam	Lafleche	Sask.	Multi-purpose Res.	1957	15,000	30,120	627,922.08
Lajord	Lajord	Sask.	Flood Control	1936	—	300	13,800.00
Lake of the Rivers	Assiniboia	Sask.	Stockwatering	1938	—	300	10,805.00
Larsen Dam	Radville	Sask.	Multi-purpose Res.	1957	—	500	36,437.00
LaSalle River Dams	LaSalle	Man.	Stockwatering	1941	—	900	22,989.00
Last Mountain Lake	Qu'Appelle Valley	Sask.	Irr. & Water Control	1941	x	—	42,721.00
*Leavitt Irrigation	Mountain View	Alta.	Irrigation	1939	7,000	7,050	65,578.00
Lebret	Qu'Appelle Valley	Sask.	Irr. & Water Control	1941	x	—	16,307.00
Little Manitou Lake	Watrous	Sask.	Diversión Canal	1957	—	—	39,271.00
Long Creek No. 1	Estevan	Sask.	Stockwatering	1938	—	137	8,729.00
Long Creek No. 2	Estevan	Sask.	Stockwatering	1938	—	90	8,701.00
McCraney, R.M. of	Kenaston	Sask.	Stockwatering	1937	—	350	1,896.00
*Magrath	Magrath	Alta.	Irrigation	1939	4,000	—	2,756.00
Maple Creek	Maple Creek	Sask.	Irrigation	1938	10,000	23,260	356,179.00

Name of Project	Location	Prov.	Type of Project	Completed	Irr. Ac.	Acre Ft.	Costs
Mary Jane Storage	Manitou	Man.	Multi-purpose Res.	Incomplete	-	1,150	\$ 47,964.00
Middle Creek	Battle Creek	Sask.	Irrigation	1937	1,000	20,000	18,663.00
Minnedosa Dam	Minnedosa	Man.	Storage	1950	20	1,500	105,051.00
Moose Jaw Creek	Lang	Sask.	Irrigation	1938	2,250	2,180	7,618.00
Moose Mountain	Corning	Sask.	Irrigation	1937	-	8,000	14,829.00
Morden Dam	Morden	Man.	Irr. & Stockwatering	1941	100	1,200	344,274.00
Mountain View	Mountain View	Alta.	Storage	1936	-	4,200	3,000.00
Oak Lake	Oak Lake	Man.	Irrigation	1956	13,000	-	119,205.00
Oxbow Dam	Oxbow	Sask.	Irr. & Stockwatering	1941	3,900	3,200	17,436.00
Pipestone Lake	Broadview	Sask.	Stockwatering	1938	-	1,600	11,785.00
*Raymond	Raymond	Alta.	Irrigation	1943	3,000	1,600	6,000.00
Richardson-McKinnon	Consul	Sask.	Irrigation	1946	3,000	-	53,913.00
Rock Lake Reservoir	Brooks	Alta.	Irrigation	1957	11,000	-	133,984.00
*Rolling Hills	Rolling Hills	Alta.	Irrigation	1938	25,000	-	46,839.00
Roughbark Creek	Goodwater	Sask.	Stockwatering	1937	-	1,500	9,314.00
Roseau River Dam	Dominion City	Man.	Multi-purpose Res.	1957	-	-	54,705.00
Rosthern Water Storage	Rosthern	Sask.	Storage	1958	-	160	22,613.00
Russell Creek	Pambrun	Sask.	Irrigation	1951	1,000	2,000	66,493.00
St. Malo Dam	St. Malo	Man.	Multi-purpose Res.	1958	-	1,770	248,937.00
Saskatoon	Saskatoon	Sask.	Storage	1940	-	1,200	290,446.00
Seven Persons	Seven Persons	Alta.	Stockwatering	1943	-	800	12,103.00
Souris-Estevan	Estevan	Sask.	Irr. & Stockwatering	1941	-	-	91,133.00
Souris River	Weyburn	Sask.	Flood Control	1948	-	-	11,998.00
Souris, Town of	Souris	Man.	Stockwatering	1935	-	150	3,841.00
Swift Current	Swift Current	Sask.	Irrigation	1946	30,000	95,000	816,472.00
Tantallon	Tantallon	Sask.	Stockwatering	1942	-	-	2,790.00

Name of Project	Location	Prov.	Type of Project	Comp- leted	Irr. Ac.	Acre Ft.	Costs
Thunder Creek	Kettlehut	Sask.	Flood Irrigation	1948	-	-	\$ 27,204.00
Val Marie	Val Marie	Sask.	Irrigation	1937	5,920	7,000	214,558.00
Val Marie West	Val Marie	Sask.	Irrigation	1940	4,230	2,000	150,639.00
Valeport Dyke	Valeport	Sask.	Flood Irrigation	1958	1,500	-	139,748.00
Wawanesa Dam	Wawanesa	Man.	Irr. & Stockwatering	1941	-	-	125,332.00
Weyburn	Weyburn	Sask.	Flood Irrigation	1940	-	4,000	51,311.00
Wild Horse Storage	Cressday	Alta.	Irrigation	1936	3,600	4,500	24,370.00
Wood River Development	Coderre and Gravelbourg	Sask.	Stockwatering	1942	-	4,923	33,738.00

* - P.F.R.A. gave assistance to a project already in existence to improve storage capacities, canals and distribution systems.

x - Ultimate irrigation development for all projects along Qu'Appelle River Valley 30,000 - (total storage capacity - 95,600 acre feet).

APPENDIX V
CUMULATIVE STATEMENT
Development and Operation of Community Pastures under the
Prairie Farm Rehabilitation Act
1938 to March 31, 1959

Fiscal Year	No. of Pasture Units in Operation	Area of Land in Pastures (acres)	Total Cost of Construction of Pastures \$	Livestock Units Carried on Pastures	Acres* per Unit of Livestock	Cost of Operation Revenue \$	Operating Costs \$	Net Operating Cost per Unit of Livestock \$	Average Charge per Unit Livestock to Farmers \$
1938-39	14	189,800	165,995.03	3,231	58.7	6,339.92	10,185.52	3.15	1.96
1939-40	26	612,300	663,471.25	11,522	53.1	21,632.71	20,945.84	1.82	1.88
1940-41	35	884,500	1,004,305.91	23,245	38.1	43,451.56	35,291.05	1.52	1.87
1941-42	38	936,548	1,187,360.92	33,230	28.2	65,434.89	50,607.22	1.52	1.97
1942-43	45	1,261,100	1,129,487.54	51,127	24.7	98,292.32	79,906.76	1.56	1.92
1943-44	46	1,268,140	1,558,055.31	54,472	23.3	111,114.25	107,534.66	1.97	2.04
1944-45	49	1,337,320	1,669,012.21	59,997	22.3	151,461.08	117,064.90	1.95	2.52
1945-46	50	1,361,440	1,857,020.37	67,778	20.1	167,045.16	136,567.09	2.01	2.46
1946-47	53	1,412,860	2,072,274.21	68,493	20.6	198,115.27	145,292.51	2.12	2.89
1947-48	53	1,417,320	2,208,919.12	66,347	21.4	203,888.11	161,471.05	2.43	3.07
1948-49	54	1,436,480	2,486,277.28	71,393	20.1	204,012.40	175,666.27	2.46	2.86
1949-50	54	1,439,680	2,809,196.14	70,308	20.5	211,624.23	172,255.25	2.45	3.01
1950-51	56	1,521,080	3,237,330.55	68,858	22.1	221,129.45	217,867.15	3.16	3.21
1951-52	57	1,574,642	3,426,586.10	77,240	20.4	335,327.16	237,742.13	3.08	4.34
1952-53	59	1,652,020	3,754,098.41	94,137	17.5	438,513.75	373,737.36	3.97	4.66
1953-54	60	1,678,736	3,963,572.83	109,583	15.3	507,179.14	490,807.89	4.48	4.55
1954-55	60	1,696,900	4,273,916.79	106,322	15.9	496,805.78	466,153.69	4.38	4.66
1955-56	60	1,728,700	4,509,668.59	108,499	15.8	499,045.13	501,540.73	4.67	4.60
1956-57	61	1,759,570	4,832,863.47	117,441	14.9	548,601.01	508,002.83	4.33	4.67
1957-58	61	1,796,275	5,119,317.01	119,398	15.0	552,938.40	607,129.23	5.08	4.63
1958-59	62	1,815,265	5,509,958.43	117,032	15.5	542,606.90	686,448.88	5.87	4.64
						5,642,558.62	5,302,218.01		

* - A livestock unit indicates one head of cattle, one horse, or five sheep.

A pasture unit may include one or more pastures, but it is operated under one management.

APPENDIX VI

P.F.R.A. COMMUNITY PASTURES IN OPERATION DURING THE FISCAL YEAR ENDED MARCH 31, 1959

Community Pasture & Headquarters	Total Area of Pasture Fenced (Acres)	Accumulated Cost of Construction March 31, 1958	Accumulated Cost of Construction March 31, 1959	1958-1959	
				Cattle	Horses
SASKATCHEWAN					
Coalfields #4, North Portal	32,380	148,740.78	156,091.66	2,624	220
Estevan-Cambria #5-6, Macoun	6,720	18,168.68	18,168.68	486	10
Masefield #17, Orkney	34,880	100,391.42	101,739.39	1,494	4
Lone Tree #18, Bracken	33,600	93,571.92	96,466.71	2,229	62
Battle Creek #20, Divide	66,880	115,233.66	131,504.61	2,511	37
Nashlyn #21, Consul	61,520	86,554.86	87,867.36	2,269	3
Govenlock #22, Govenlock	68,800	106,567.04	108,454.45	2,069	10
Lomond #37, Pasture #1, Goodwater	23,360	80,189.72	81,082.37	2,899	44
Lomond #37, Pasture #3, Maxim	18,400	71,340.38	77,448.68	1,629	23
Laurier #38, Lomond #37 - #2, Radville	37,175	89,838.71	106,043.98	2,636	52
The Gap #39, Hardy	13,920	84,274.31	84,564.76	1,244	48
Val Marie #47, Val Marie	156,320	257,958.21	267,268.77	7,442	17
Beaver Valley #47A, Val Marie	11,360	25,445.11	25,810.86	616	-
Reno #51, Pasture #1, Robsart	17,120	61,202.89	61,733.54	1,224	18
Reno #51, Pasture #2, Consul	11,360	28,814.38	29,234.38	704	-
Tecumseh #65, Forget	18,400	67,377.91	77,298.59	2,018	26
Brokenshell #68, Pasture #1, Yellow Grass	22,720	69,324.89	95,390.20	1,799	64
Brokenshell #68, Pasture #2, Weyburn	8,160	14,818.47	15,458.47	400	7
Excel-Key West #71-70, Ormiston	30,740	90,871.62	96,260.44	2,551	10
Auvergne-Wise Creek #76-77, Ponteix	42,880	140,173.86	140,328.90	3,255	1
Wellington #97, Tyvan	25,360	103,541.09	111,148.25	3,413	52
Caledonia-Elmsthorpe #99-100, Milestone	26,400	116,307.87	118,692.02	2,173	62
Shamrock #134, Shamrock	26,080	82,798.39	86,319.76	1,682	38
Swift Current-Webb #137-8, Beverly	18,720	81,878.71	81,878.71	1,502	46
Gull Lake #139, Tompkins	10,720	32,362.21	32,362.21	542	-

Community Pasture and Headquarters	Total Area of Pasture Fenced (Acres)	Accumulated Cost of Construction March 31, 1958	Accumulated Cost of Construction March 31, 1959	1958-1959 Stock Pastured	
				Cattle	Horses
SASKATCHEWAN - (Cont'd.)					
Pasture Units					
Big Strick #141, Maple Creek	18,160	44,197.75	44,197.75	1,518	-
Bitter Lake #142, Maple Creek	47,410	118,504.20	119,809.80	2,797	-
Spy Hill #152, Welby (Operated in conjunction with Ellice, Manitoba)	19,570	51,696.15	55,322.52	2,157	30
Elbow #223-4, Elbow	30,080	80,242.45	80,810.89	2,141	48
Beaver Hills #245-6, Homefield P.O.	44,160	115,111.64	118,069.01	3,147	151
Willner #253, Rosemae, P.O.	13,280	80,646.25	81,709.05	1,661	-
Coteau #255, Birsay	27,520	62,818.09	64,191.82	1,478	21
Monet #257, Elrose	46,840	111,055.85	111,548.24	2,908	29
Fairview #258, Rosetown	17,000	114,620.21	115,260.23	1,041	8
Newcombe #260, Glidden	52,960	164,069.32	167,020.63	3,282	22
Mantario #262, Empress, Alta.	24,960	69,706.80	70,406.80	1,658	-
Cote	10,080	-	41,609.23	-	-
Mount Hope-Prairie Rose #279-309	31,540	61,202.77	98,440.84	1,867	-
Wreford #280, Hatfield	13,440	79,731.84	81,055.40	1,143	-
McCraney #282, Davidson	10,720	69,677.74	69,677.74	1,195	-
Rudy-Rosedale #284-3, Broderick	19,200	88,333.45	90,057.21	1,663	64
Hillsburgh #289, Brock	13,600	55,439.48	56,439.48	1,017	-
Eagle Lake #289-319, Netherhill	23,250	83,830.94	91,445.69	1,068	6
Kindersley-Elma #290-1, Smiley	21,400	112,394.62	112,394.62	1,886	27
Usborne #310, Venn	12,680	41,680.54	46,018.57	1,052	-
Dundurn #314, Dundurn	44,840	111,080.89	113,477.54	2,184	-
Montrose #315, Donavon	20,480	64,591.49	67,005.91	1,143	-
Oakdale #320, Beaufield	20,800	60,512.93	62,470.08	1,438	14
Antelope Park #322, Hoosier	34,320	102,107.61	106,910.60	2,655	57
Wolverine #340, Plunkett	17,280	68,920.05	73,320.05	1,928	-
Mariposa #350, Kerrobert	26,880	88,617.34	93,370.29	1,756	48
Progress #351, Kerrobert	19,680	65,149.48	65,149.48	1,378	-

Community Pasture and Headquarters	Total Area of Pasture Fenced (Acres)	Accumulated Cost of Construction March 31, 1958	Accumulated Cost of Construction March 31, 1959	1958-1959	
				Cattle	Horses

Pasture Units SASKATCHEWAN - (Cont'd.)

Heart's Hill #352, Compeer, Alta.	15,100	57,845.02	58,931.77	1,544	1
Park #375, Langham	7,040	22,633.89	22,633.89	362	-
Battle River-Cutknife #438-9, Gallivan	30,480	86,009.64	86,009.64	1,388	33
Royal #465, Marcelin	65,120	197,087.61	213,512.64	1,973	37
Paynton #470, Paynton	23,840	76,293.58	79,542.32	1,198	20
Totals for Saskatchewan	1,647,685	4,773,556.71	5,046,437.48	105,037	1,470

Special Project - Bitter Lake Irrigation included in Bitter Lake Pasture

Pasture Units MANITOBA

Ellice Pasture, Welby, Sask. (operated in conjunction with Spy Hill #152)

Archie Pasture, Welwyn, Sask.	20,320	28,746.37	28,746.37	-	-
Portage Pasture, Poplar Point	39,740	92,063.11	92,093.20	1,018	18
Woodlands Pasture, Poplar Point	14,640	44,793.85	44,793.85	1,952	43
Lakeview Pasture, Langruth	20,960	68,647.13	69,793.13	2,272	55
Westbourne Pasture, Gladstone	29,280	80,724.71	80,724.71	1,805	4
Langford Pasture, Neepawa	11,520	40,338.67	42,592.62	1,512	15
Wallace Pasture, Elkhorn	19,680	70,446.46	71,097.44	1,804	27
San Clara	3,280	(Operated by R.M. Wallace)			
	8,160	-	33,679.63	-	-

Totals for Manitoba

167,580	425,760.30	463,520.95	10,363	162
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GRAND TOTALS

1,815,265	5,119,317.01	5,509,958.43	115,400	1,632
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APPENDIX VII

MAJOR PROJECTS - IRRIGATION RECLAMATION

(Projects by Special Votes of Parliament, Administered by P.F.R.A., to March 31, 1959)

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
MANITOBA						
Assiniboine River Diking & Cut Off	Brandon	River Control	Incomplete	-	-	\$ 987,370.00
North-West Escarpment Reclamation Proj.-Riding Mtn. Area	Dauphin	Watershed Control	Incomplete	-	-	980,573.00
Saskatchewan River Reclamation - Pasquia Area	The Pas	Reclamation	Incomplete	135,000	-	2,108,796.00
ALBERTA						
Bow River	Medicine Hat	Irrigation	Incomplete	235,000	408,862	54,398.00
(a) Purchase of Canada Land & Irrigation Company						2,353,182.00
(b) Development & Construction						20,239,827.00
St. Mary	Lethbridge	Irrigation	Incomplete	510,000	320,000	13,597,996.00
Belly River Diversion	Lethbridge	Irrigation	1950	-	-	53,901.00
BRITISH COLUMBIA						
Cawston Benches	Keremeos	Irrigation (pump)	1951	629	2,000	185,491.00
Chase & Johnston - Western Canada Ranching	Kamloops	Irrigation	1951	755	-	98,243.00
Western Canada Ranching #2	Kamloops	Irrigation (pump)	1950	54	-	58,069.00
Lillooet - Pemberton	Pemberton	River Control	1953	-	-	1,056,539.00
South Thompson - Niskonlith Gravity Project	Kamloops	Irrigation	Incomplete	1,030	1,200	12,282.00
Westbank Project	Kelowna	Irrigation	1950	1,200	2,500	537,450.00
Bankhead Irrigation Project	Kelowna	Irrigation	1951	92	-	32,229.00
Penticton West Bench	Penticton	Irrigation (pump)	1953	800	-	66,362.00
B.C. Fruitlands	Kamloops	Irrigation	Incomplete	2,000	-	175,761.00

(Above includes ONLY Construction Costs)

APPENDIX VIII
PRAIRIE FARM REHABILITATION ACT - EXPENDITURE BY ACTIVITIES
April 1, 1935 - March 31, 1959

	1935-1958	1958-1959	Total
ADMINISTRATION			
Ottawa Administration	338,462	33,254	371,716
Regina Administration	1,487,753	157,231	1,644,984
Total	<u>1,826,215</u>	<u>190,485</u>	<u>2,016,700</u>
EQUIPMENT			
Purchase of Equipment	1,490,524	186,668	1,677,192
Upkeep of Equipment	990,779	107,695	1,107,474
Equipment Depot	2,209,660	317,031	2,526,691
Total	<u>4,699,963</u>	<u>611,394</u>	<u>5,311,357</u>
LAND UTILIZATION			
Supervision	684,729	50,426	735,155
Construction of Community Pastures	7,379,895	583,165	7,963,060
Pasture Improvements	463,795	99,228	563,023
Operation of Community Pastures	5,037,129	734,889	5,772,018
Purchase of Bulls	649,520	41,985	691,505
Re-establishment of Farmers	-	-	-
Grass Seeding & Experimental Regrassing	710,651	28,276	738,927
Total	<u>14,925,719</u>	<u>1,537,969</u>	<u>16,463,688</u>
WATER DEVELOPMENT			
Supervision	804,764	20,067	824,831
Small Projects including Engineering	16,684,461	1,195,483	17,879,944
Large Irrigation and Storage Projects			
Supervision	1,856,774	73,804	1,930,578
Construction and Improvements	8,641,291	534,611	9,175,902
Maintenance and Operation	6,209,576	347,968	6,557,544
Re-establishment of Farmers	216,229	6,308	222,537
Surveys and Explorations	1,660,484	-	1,660,484
Purchase of Land	751,992	12,552	764,544
Total	<u>36,825,571</u>	<u>2,190,793</u>	<u>39,016,364</u>
Cultural work for soil drifting control and related problems prior to April 1, 1946 (under administration of Experimental Farms Service).	4,966,394		4,966,394
GRAND TOTAL	<u>63,243,862</u>	<u>4,530,641</u>	<u>67,774,503</u>

SPECIAL VOTES UNDER P.F.R.A. ADMINISTRATION

	<u>1935-1958</u>	<u>1958-1959</u>	<u>Total</u>
Assiniboine and Qu'Appelle Rivers, Surveys and Construction	1,028,775	117,909	1,146,684
Lillooet Project B.C. Construction & Exploration	1,170,133	-	1,170,133
Land Reclamation & Development in B.C.	1,940,049	175,761	2,115,810
St. Mary Irrigation Project - Alberta	19,335,215	874,199	20,209,414
Bow River Project - Alberta	25,648,574	1,408,207	27,056,781
Red Deer River Project - Alberta	971,768	75,293	1,047,061
Rivers Dam - Manitoba	22,855	421,581	444,436
Other Miscellaneous Projects - Construction	210,392	-	210,392
Soil Mechanics Building	-	103,769	103,769
Land Protection & Reclamation - Manitoba	2,862,682	255,462	3,118,144
South Saskatchewan River Project - Saskatchewan	4,393,439	1,503,901	5,897,340
Buffalo Pound Project - Saskatchewan	1,656,300	161,874	1,818,174
Surveys and Engineering Costs	10,523,317	1,705,815	12,229,132
GRAND TOTAL	<u>69,763,499</u>	<u>6,803,771</u>	<u>76,567,270</u>

- (a) Included in Cultural Administration to March 31, 1938.
- (b) Included in Water Development Administration to March 31, 1938.
- (c) Includes \$388,923.57 expended under the Supplementary Public Works Construction Act, 1935.
- (d) Includes \$95,198.65 expended on St. Mary River Project (administration) in 1946-47.
- (e) Includes \$300,879.29 expended on St. Mary River Project (construction) in 1946-47.
- (f) Includes \$147,530.22 expended on St. Mary River Project (administration) in 1947-48.
- (g) The amounts shown include Red Deer \$325,642 and South Saskatchewan \$370,093 provided by Department of Reconstruction. In addition, the following amounts were paid from P.F.R.A. Vote: South Saskatchewan - \$59,568; Red Deer - \$33,207.
- (h) General Survey charges now being paid from other P.F.R.A. Votes.
- (i) Amounts shown in Notes (d), (e) and (f) to be added to this total.
- (j) Veterans' Land Act expenditure not included.
- (k) Expenditures until 1949-50 included under Land Utilization and Water Development.
- (l) Previously under P.F.R.A. Vote (see item (g)).
- (m) Re-establishment of Farmers now under Water Development.
- (n) Previously under Land Utilization (see item (m)).

APPENDIX IX
EXPENDITURES BY PROVINCES
Prairie Farm Rehabilitation Act and Special Votes under its Administration
April 1, 1935 - March 31, 1959

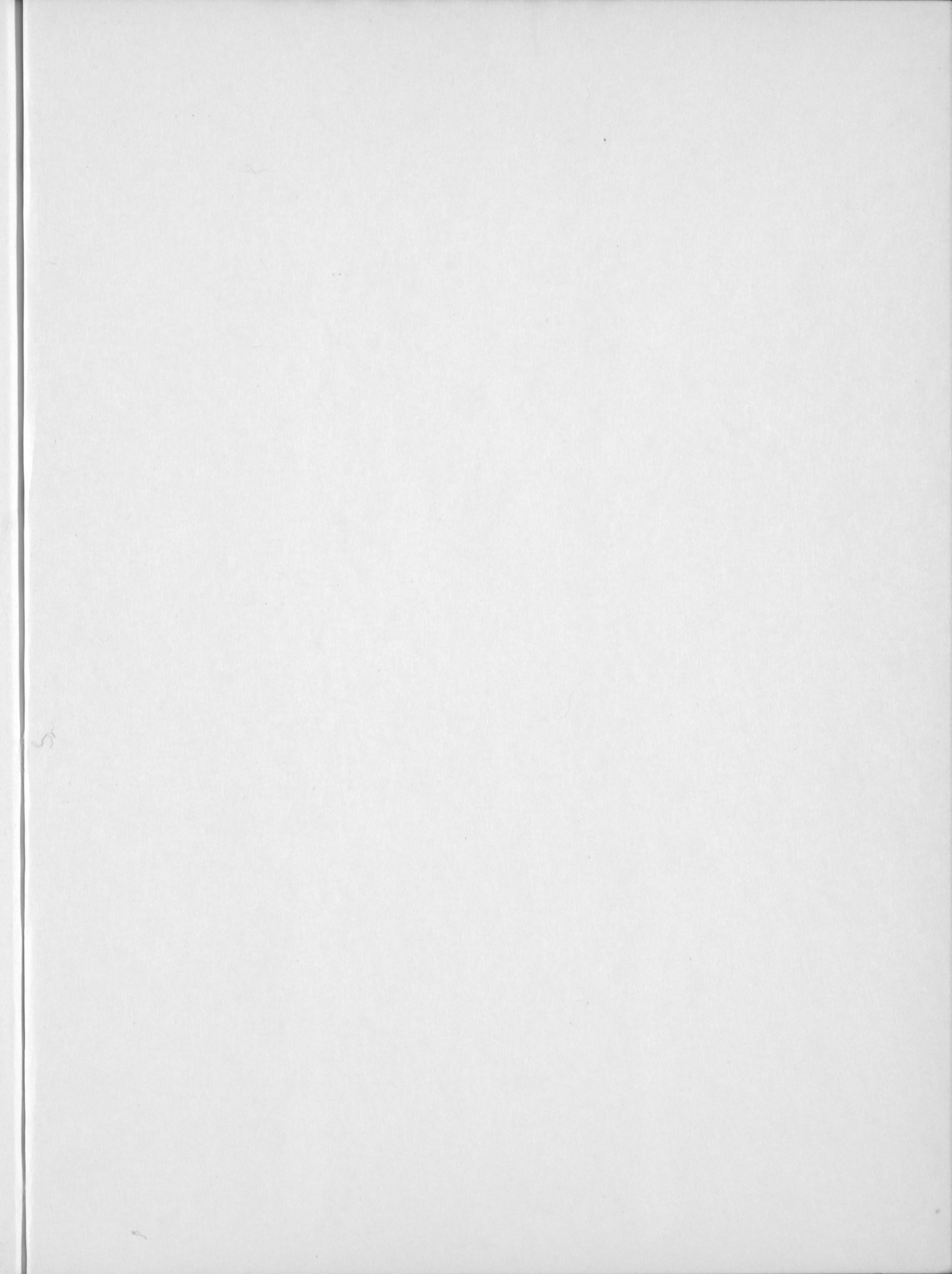
	<u>Manitoba</u>	<u>Saskatchewan</u>	<u>Alberta</u>	<u>British Columbia</u>
P.F.R.A.	5,464,645	49,789,652	8,027,676	
Major Irrigation and Reclamation in the Prairie Provinces	469,386	7,914,985	48,074,602	
Land Reclamation, Construction and Development in B.C.				3,285,487
Land Protection and Reclamation	3,118,144			
Assiniboine and Qu'Appelle Rivers	1,053,976	92,708		
Surveys and Engineering Costs	1,926,908	6,446,479	4,032,110	152,487
Administration	<u>343,006</u>	<u>2,128,864</u>	<u>1,885,723</u>	<u>134,935</u>
	<u>12,376,065</u>	<u>66,372,688</u>	<u>62,020,111</u>	<u>3,572,909</u>
				<u>144,341,773</u>
REVENUE				
Revenue Received from Projects under P.F.R.A. Office to March 31, 1959				
Pasture Operation and General Revenue			5,931,074	
Irrigation Project Operation (Under P.F.R.A. Vote)			669,083	
Irrigation and General Revenue (Major Projects Vote)			<u>2,198,498</u>	
TOTAL			<u>8,798,655</u>	

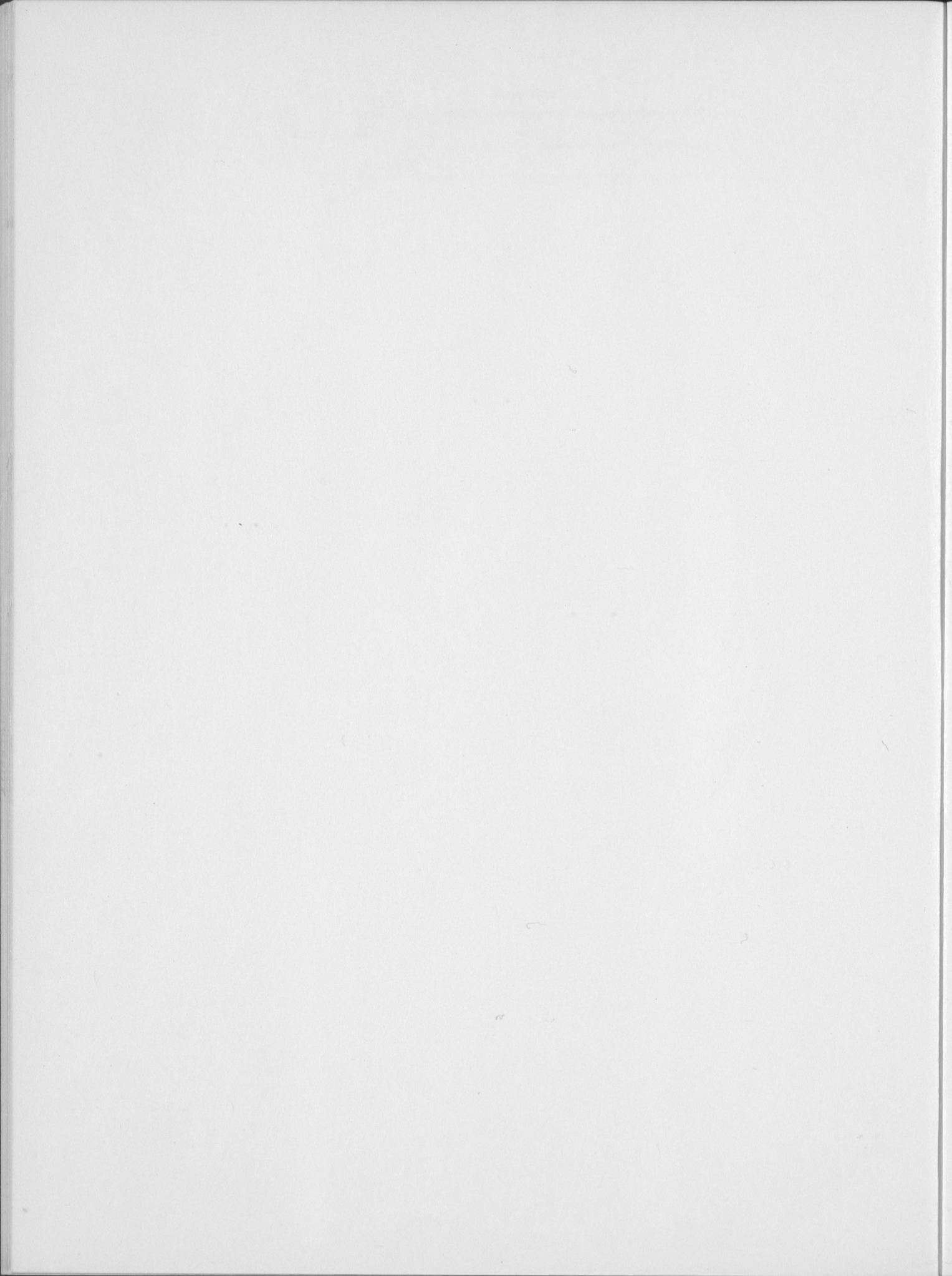
APPENDIX X TOTAL IRRIGATION DEVELOPMENT - ALBERTA AND SASKATCHEWAN

Project	Year Started	Irrigable Acreage		Major Reservoirs	(Live Storage (Acre Feet))	
		Present	Ultimate Proposals		Present	Ultimate
<u>Mountain & Foothill Region</u>						
United Irrigation District	1921	34,000	34,000	Driggs Lake	7,500	7,500
Mountain View Irrigation Dist.	1925	3,600	3,600			
Leavitt Irrig. District	1943	4,600	4,600			
Aetna Irrig. District	1943	8,300	8,300			
Macleod Irrig. District	1948	3,500	3,500			
Other		12,300	32,700			
		66,300	86,700			
Total						
<u>Western Prairie Region</u>						
St. Mary-Milk River Project	1901	318,200	510,000	St. Mary Reservoir Chin	270,000	270,000
				Jensen	50,000	150,000
				Ridge	14,000	14,000
				Verdigris	80,000	80,000
				Waterton	-	110,000
				Lake McGregor	-	130,000
				Travers	150,000	250,000
Bow River Irrig. Project	1918	131,000	240,000	Little Bow	100,000	100,000
				Chestermere	12,000	12,000
Western Irrig. District	1908	50,000	50,000	Lake Newell	3,000	3,000
Eastern Irrig. District	1914	200,000	281,000	Rock Lake	90,000	100,000
				Crawling Valley	11,000	11,000
				Keho	-	120,000
Lethbridge Northern Irrig. Dis.	1922	96,100	96,100	Berry Creek Reservoir	40,000	40,000
Berry Creek Project	1938	3,000	8,000	Ardley Reservoir	30,000	30,000
Red Deer Irrig. Proj.	-	-	300,000	Buffalo Lake	-	300,000
				Craig & Hamilton	-	250,000
					-	
Total						
Other		52,000	201,000			
		850,300	1,686,100			

Project	Year Started	Irrigable Acreage		Major Reservoirs	(Live Storage (Acre Feet))	
		Present	Ultimate Proposals		Present	Ultimate
Eastern Prairie Region (Cont'd)						
South Saskatchewan				Moose Mountain	9,000	9,000
Extension - Qu'Appelle	-	-	24,000			
Other		20,000	34,000			
Total		28,000	75,000			
Total Irrigation (Alberta & Saskatchewan)		1,069,500	2,705,800			

Project	Year Started	Investments		Major Reservoirs	Date Due			
		Present	Proposals		FEB 13	FEB 22'63	FEB 16 '62	
<u>Central Pacific Region</u>								
French John Valley Park	1949	750	6,000					
South Sask. Irrig. Proj.			270,000					
<u>Red River Extension</u>								
		12,380	200,000	South Sask. Reservoir				
		14,930	14,000	Dakota Reservoir				
			100,000	Blackstrap Reservoir				
				Lavigne Reservoir				
<u>Crocker-Harris Region</u>								
Costa Rica-Val Marie Irrig. Proj.	1937	10,000	13,000	Cypress Lake	100,000			
				Easton	2,000			
<u>Consolidated Valley Region</u>								
	1945	7,000	10,000	Val Marie Reservoir	12,000			
	1949	2,000	3,000	Pitkin Lake Reservoir				
	1956	10,000	10,000					
		1,000,000	5,000,000	Grass Valley	6,000			
				Donnie Lake	10,000			
				San Joaquin	5,000			
	1940	12,000	27,000	Harris	25,000			
				Duncan	5,000			
				Highfield	5,000			
	1953	38,000	32,000	Quincy	6,000			
		50,000	34,000	Cadillac	1,000			
	1952	400	34,000	Robertsonville	8,000			
	1951	500	1,200	Admiral				
				Lefferts				
			8,000	Major Reservoirs				
		110,000	Proposals (Present)					
			Multiple V-Codes					
<u>Eastern Pacific Region</u>								
Lewis-Fair Hill Irrig.	1910	3,000	6,000	Butte's Pond Lake	40,000			120,000
South-Crocker-Harris Irr. Proj.	1917	5,000	11,000	Deer Lake	3,000			50,000





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